December 1943

Chemical Industries

The Chemical Business Magazine

Textiles Need Alkalies

Silk and rayon for parachutes . . . wool for clothing . . . cotton for countless essentials. Whatever natural or synthetic fabric our fighting forces require, you can be sure alkalies and related products have been used in one or more processes of manufacture. In war as in peace alkalies are indispensable!

SOLVAY SALES CORPORATION *Alkalies and Chemical Products Manufactured by The Solvay Process Comp*

CHRISTMAS 1943 finds many Westvaco men in far places unable to extend in person the quiet word of good cheer and the firm handclasp that express the Spirit of the Season.

For them — as for ourselves — we take this opportunity again to express deep appreciation of the friendly understanding of consumers of our products and the cheerful cooperation of our friends in industry all through this difficult year.

For the year ahead we pledge practical expression of our sentiment by putting forth unstinted efforts to continue to serve you faithfully and well.

WESTVACO CHLORINE PRODUCTS CORPORATION

Ernie Pyle, *FAMED WAR CORRESPONDENT,*

finds pure water vital to our fighting men

ERNIE PYLE, FAMED SCRIPPS-HOWARD WAR CORRESPONDENT

". . . you could almost say an army marches on its water," wrote Ernie Pyle in a recent dispatch from the Mediterranean front. "When a water point is found, the engineers wheel in their portable purifying unit. This consists of a motorized pump, and sand filter, chlorinating machine and a collapsible 3,000-gallon canvas tank. The chlorine we inject comes in powder form in 1 gallon cans—we usually use 1 part of chlorine to a million parts of water. The engineers of the 45th Division brought with them enough chlorine to last 6 months. In addition to chlorine, alum and soda ash are injected into the water."

THAT "chlorine in powder form" which Ernie Pyle speaks of is, of course, high test calcium hypochlorite, and, as likely as not, it's Mathieson HTH. That soda ash, too, is probably fused soda ash in tablet form made by Mathieson especially for use by our armed forces overseas.

Not as spectacular but just as important a war job is being done on the production front by other Mathieson Chemicals—caustic soda, soda ash, liquid chlorine, ammonia, sodium chlorite, sodium methylate, magnesium metal, liquid and solid carbon dioxide. These products are vital raw materials in nearly every phase of American war production, including ships, planes, tanks, guns, gasoline, clothing, food, medical supplies and many other materials which will go to make up final victory for the United Nations.

Mathieson CHEMICALS

ARMY NAVY

MATHIESON EAGLE-THISTLE CHEMICALS

THE MATHIESON ALKALI WORKS (Inc.) 60 EAST 42nd STREET, NEW YORK, N. Y.

LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS . . . SODIUM METHYLATE

Chemical Industries

THE BUSINESS MAGAZINE for MAKERS and USERS of CHEMICALS

Management • Research • Production • Marketing

VOL. 53—NO. 7

December, 1943

Contents

Published monthly, except twice in October, and entered as 2nd class matter Dec. 22, 1934, at the Post Office at New Haven, Conn., under the Act of March 3, 1879. Subscription, Domestic, Canadian and Latin American, $4 a year; Foreign $5. Single copies, 50 cents; November issue, 75 cents. Canadian subscriptions and remittances may be sent in Canadian funds to Chemical Industries, P. O. Box 100, Terminal A, Toronto, Canada. Copyrighted, 1943, by Tradepress Publishing Corp., 522 Fifth Avenue, New York 18, N. Y., Murray Hill 2-7888; Horace T. Hunter, President; John R. Thompson, Vice-President and Treasurer; J. L. Frazier, Secretary.

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THE READER WRITES

Challenge to Chemists

To the Editor of Chemical Industries:

During the dark days when prosperity was seen about every bright-appearing corner, the magazines devoted to chemists occasionally printed an article which advised the underpaid and unemployed in the profession. Amid the genuine attempts to aid and comfort was an undertone of accusation, of labeling the less fortunate chemist as a bottle-washer, a nincompoop, an idiot, a hermit, and a maladjusted moron.

Even when such a praiseworthy effort as the Chemists' Advisory Council was being formed to help the increasing number of idle, one section of the American Chemical Society boldly claimed that those among them who were not working could not properly be called chemists—they were failures and fools. A prominent member of the society privately referred with deprecation and contempt to the chemist-registrants at a free employment service. An author writing for the *Journal of Chemical Education* implied that successful chemists had some of the good qualities of a William Shakespeare, an Emily Post, a Dale Carnegie, and a Charles Schwab all in one. Aspiring test-tube jugglers absorbed in the noble and honest achievements of great scientists were told that something more than brains was wanted in industry—something called personality and clean-cut appearance, and an Americanized name. Mendelejeef and Cavendish and Gibbs would have been unemployed! Chemists, in the era of too-few jobs, when one out of every six people in the country were on the relief rolls, received their full share of the inspirational, how-to-do-it-well and how-to-succeed books and articles which flooded the market.

With the interest in production, chemists are being called upon to be producers and nothing else. All those accusations involving personality and appearance are now secondary and forgotten, are a matter of history. The conditions are reversing, and chemists are in a position to advise employers, if they so wish, that the reason why they cannot get chemists lies in their personality, in their playing of favorites, in their incurable stupidity. Chemists may without recourse to vengeance or satire gently admonish the employer for harboring nepotism and chicanery, for being a big bag of wind, for knowing remarkably little science. But this is not happening.

Hardly any organized demand for more pay exists. And only some individuals are rightfully requesting a greater measure of security along with increases in salary. Recent publications and cloak-room discussions indicate the chemist wants a more dignified social status, in line with his present war importance.

Perhaps the esteem with which physicians are held is to be desired. Yet this is a result of not only portraying the altruistic, idealistic, self-sacrificing physician but also the fact that medical men have contact with the public. Chemists, as a group, are a cloistered, interned sect developing traits not adaptable for forging ahead socially. Some of the very accusations leveled at the less-prosperous chemists during the terrible thirties can now be given as the reason for a lack of more respect from the public. No matter the amount of better things for better living, no matter the number of advertisements crediting white-frocked laboratory residents as responsible for this or that product, who is going to admire a narrow-minded, self-centered hermit, unable to converse on subjects outside of science? Chemists, as a group, lack the social consciousness, the interest in affairs which goes hand in hand with social success. Until such traits are developed, the industrial chemist will have no special status however much he may try to achieve it.

Many who go under the name of chemist are undoubtedly pleasant, well-rounded, respected members of their community. But, more likely than not, they do their work behind a desk. They are the kind who transfer to more profitable endeavors, who like chemist Donald Nelson or physicist Stafford Cripps become patent attorneys, executives, and politicians.

Some ask for greater political prestige for chemists—particularly at a time when senators ask why magnesium cannot be made from aluminum. There are chemists who want to make the most of the war situation. They are not alone. Capitalists and socialists, engineers and workers, the military and the civilians, technocrat and communist—all are grasping for a major part of the glory and power. Many classes and groups and professions are striving to use the war effort to suit their own selfish purposes, even the superfluous, useless members of a productive society whose worthlessness is evident during times of stress.

If chemists compete with labor and capital, with the consumers and the masses, with physicians and clergy for a greater recognition for these days and afterwards, they are rightfully and justly participating in the democratic process. Should chemists strive for this added prestige solely for the purpose of advancing themselves, without simultaneous aims for the betterment of mankind, then their's will be the struggle for a power no different than the incompetent, unscrupulous, and even ruthless ones they aim to displace.

With leadership goes responsibility; it is the responsibility for the promotion of the virtues and values which are found in the scientific spirit that can make for a better world. Scientific workers all over the world are alive to new functions. They, together with industrial chemists, are capable of carrying the beacon towards the horizon of liberty and justice for all men.

M. G.

Chlorine Cylinders

To the Editor of Chemical Industries:

We wish to stress the importance at this time of keeping chlorine cylinders in circulation. It is the shortage of cylinders for transporting chlorine that is the chief problem associated with the wartime availability of this chemical.

As you know, it is almost impossible to get new cylinders because of Government allocation of steel and a large proportion of the cylinders already in existence have been diverted to the armed forces. Chlorine or chlorine compounds are vital in guarding health by assisting in sanitation measures, in the purification of drinking water, in preventing spoilage of foodstuffs, in medicinal preparations, and in the manufacture of many strategic chemicals. Dependence on chlorine, which has long been characterized as "the chemical of a thousand uses," is increasing constantly in war operations and production processes.

Manufacturers, fortunately, appear able to produce sufficient chlorine, and we believe that there are enough standard steel cylinders to take care of essential users, *if* cylinders are kept in circulation.

It is easy to set an empty cylinder aside and forget about it, but doing so under present conditions may mean delay in meeting a vital war need. It thus becomes increasingly imperative to keep reminding all purchasers of chlorine to return cylinders for refilling as quickly as possible.

R. T. QUINN
The Mathieson Alkali Works, Inc.
New York, N. Y.


U.S.

T. N. SANDIFER reporting

Manpower . Production . Naval Stores . Fertilizers High-Octane Gasoline . 1942 Organics Output

Manpower Problems

Manpower problems, with respect to both technical personnel and plant workers, are causing the industry more difficulty at present than fluctuations in war production plans, judging by reactions in this town.

Formally, chemical plants are getting nowhere in their efforts to attain a clear-cut deferment pronouncement on which they can go before their local boards on a particular problem. Informally, and unofficially, individual problems are being solved, so that over-all the otherwise bad effect of the current failure of WMC to act is offset to some extent.

Currently there is some hope once more that the War Manpower Commission will reconsider its earlier decision not to put certain critical occupations in the chemical field on the deferment lists which serve as a guide to most local boards. There is a prospect at this writing that some action might be taken in the near future. The situation as it stands, however, is that no action has been taken, and on a very peculiar ground which is referred to elsewhere on this page.

Meanwhile the WMC Committee on Essential Activities has called attention of regional manpower directors to the fact that the occupational classification of an individual with respect to being engaged in a critical occupation depends upon whether he is performing the functions specified for the occupation in question in an essential activity. In other words, as various persons here have read the statement, the person must still be engaged in an occupation on the list of critical jobs.

Production Outlook

Despite all talk of cut-backs, it is beginning to look, at this end-of-year period, as though 1944 will see a sharp spurt, at least in dollar value, of war production. In some quarters this has been reported as possibly as high as 25 per cent over 1943, overall.

The increasing emphasis on fertilizer needs for the coming year is reflected in plans at WPB for chemical products in this field for the coming year. To some extent fertilizer nitrates, ammonia, sulfuric acid, etc., will absorb some of the production that may be released from other products, according to the year end outlook.

Increased production schedules of ships, planes, trucks, landing craft, and similar lines, are reflected on the chemical side in requirements for coatings. The let-down in some ordnance lines, such as explosives and shells, will be offset in conversion of plants to fertilizer production or other more active requirements of the current war effort.

Naval Stores Appropriation Killed

Naval stores producers failed by a very wide margin to meet the production goals set for them earlier in the year, 78,000,000 pounds of rosin and 2,250,000 gallons of turpentine. New and increased demands for the coming year make it appear at this stage as though production will again fall short, due to increasingly difficult conditions such as manpower, reduced stockpiles, and other factors.

The House refused to approve a new appropriation for an attempt to stimulate naval stores production through use of chemicals. (This idea has attracted wide interest among some government agencies, and deserves more space than can be given here.)

Whether the Senate will restore the item is still in doubt at this writing but the outcome is being watched with considerable attention, due to the possibilities foreseen if the experiments can be pushed further.

Superphosphate Goal Up

The Chemicals Division of WPB has agreed to bring superphosphate production up to an annual rate of 7,600,000 tons, basis 18 percent superphosphate, by June 30, 1944. If this goal is made, it is estimated there will be available for use as fertilizer during the 1943-44 year a minimum of 7,000,000 tons, or 20 percent more than the total production in 1942-43.

At present there are eight plants in the United States producing concentrated superphosphate. Production in 1943-44 is expected to amount to approximately 275,000 tons, basis 45 percent P_2O_5. Sulfuric acid is stated to be the most serious bottleneck at present in superphosphate production. The larger part of the projected increase will result from making available additional supplies of sulfuric acid.

It has been agreed on the part of the industry committee for the inorganic acid industry that some

expansion of commercial sulfuric acid facilities will be necessary to meet the demand, which is essential in both fertilizer and high-octane gasoline programs.

Excess capacity of Army Ordnance explosive plants will be utilized in addition to these possible new facilities, and acid from this source will be diverted to the superphosphate program for the year ending June, 1944. The ordnance plants already have begun to move a limited quantity of acid, and by the end of the year this movement was expected to attain a rate of 380,000 tons annually.

Two additional superphosphate plants approved by WPB last summer are expected to be in operation before next June, it is said. All existing facilities will be pushed to capacity, according to present plans. Production established a record for the year ending June 1943, but the anticipated demand is 40 percent higher. Production in commercial plants is currently at the rate of 7,900,000 tons annually, or 55 percent above the 1939 figure. The Chemicals Division also is now investigating the possibility of increasing potash production in this country for the 1944-45 program, the 1943-44 year being put down for 700,000 tons from domestic plants.

Full Postwar Use of Fertilizer Plants Urged

The Secretary of Agriculture has recently appeared before the Senate Committee on Postwar Economic Policy and Planning to suggest possible government operation, after the war, of certain plants having possibilities in fertilizer production.

"I hope that before any decisions are made as to the disposal of, or dismantling of these various types of plants," he said, referring to government-owned plants making ammonia, nitrates, sulfuric acid, etc., "that a careful study will be made of their best potential utilization to aid our agriculture."

Reporting that farmers are especially interested in this potentiality, he suggested that many of these war facilities can help produce nitrogenous fertilizers or superphosphates, insecticides, or fungicides at low cost. For such purposes, he pointed out, many of these plants are located in favorable regions with respect to distribution of their products.

High-Octane Program Pushed

Federal agencies moved during the month to push completion of high-octane gasoline facilities for war use. Of the 72 major 100-octane plants in the Petroleum Administrator's program, 32 have been completed and 40 are scheduled to be completed by early in the year. In addition 22 more plants are to be built in 1944.

Why Chemical Operators Not on Critical List

It is now learned that the ground on which the War Manpower Commission bases its stand that there is no shortage of chemical operators to justify inclusion of this title in the critical list is that the U. S. Employment Service has never seen fit to report such a shortage.

The reason for this latter neglect apparently is that employers, after once attempting to get such help through this agency, and not getting it, have not tried again; hence applications fall off, and USES jumps to a conclusion.

However this may be, WMC has so far ignored the efforts of the industry, backed by the Army and Navy and WPB reports, in failing to add this title to the list of critical occupations now in use.

1942 Production of Synthetics

Under new War Production Board policy which will shortly result in the public getting a better statistical picture of war output of industries generally, particular interest awaits the statistics on chemical production. These figures may be ready by the time this can appear. The Census Bureau of the Department of Commerce is completing a survey of production of some 240 chemicals in all categories, and at this writing expects to issue production figures from January, 1941, to October, 1943, on approximately 50 of the major industrial items of chemical production.

The Tariff Commission meanwhile has compiled figures on commercial production and sales of synthetic organic chemicals in the United States for 1942, relating to production and sales of coal-tar crudes, intermediates, and dyes, coal-tar and non-coal-tar medicinals, flavors, and perfume materials, resins, rubber chemicals, and miscellaneous chemicals. For obvious reasons data concerning ordnance plant output of chemicals was omitted in this particular study.

United States coke-oven operations in 1942 resulted in an increased coal-tar output from 704 million gallons in 1941 to 740 million gallons in 1942, and the total reported production of tar, including tar from coal-gas retort plants, but excluding water-gas and oil-gas tar, amounted to 761 gallons in 1942.

The value of sales of all synthetic organic chemicals amounted to $932 million in 1942, an increase of 28 percent over 1941 sales, which were then the highest on record, and of 177 percent over the average value of sales for the period 1936-40. For special groups the largest increase that occurred in 1942 was that in coal-tar medicinals, sales of which showed a 60 percent increase in value and 29 percent gain in quantity.

The combined output of intermediate and finished coal-tar products amounted to 2 billion pounds, compared with 1.8 billion in 1941. Production of non-coal-tar chemicals increased from 5 billion to 7 billion pounds. Production and sales of coal tar dyes, flavors and perfumes, resins, rubber chemicals, color lakes and toners were less in 1942 than in 1941, while some gain was reflected in the figures for miscellaneous coal-tar chemicals and medicinals.

Coal-tar resin production decreased 15 per cent from 1941 to 1942, while non-coal-tar resins increased 38 per cent.

Genera
plating
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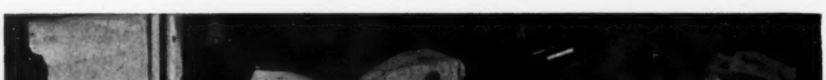
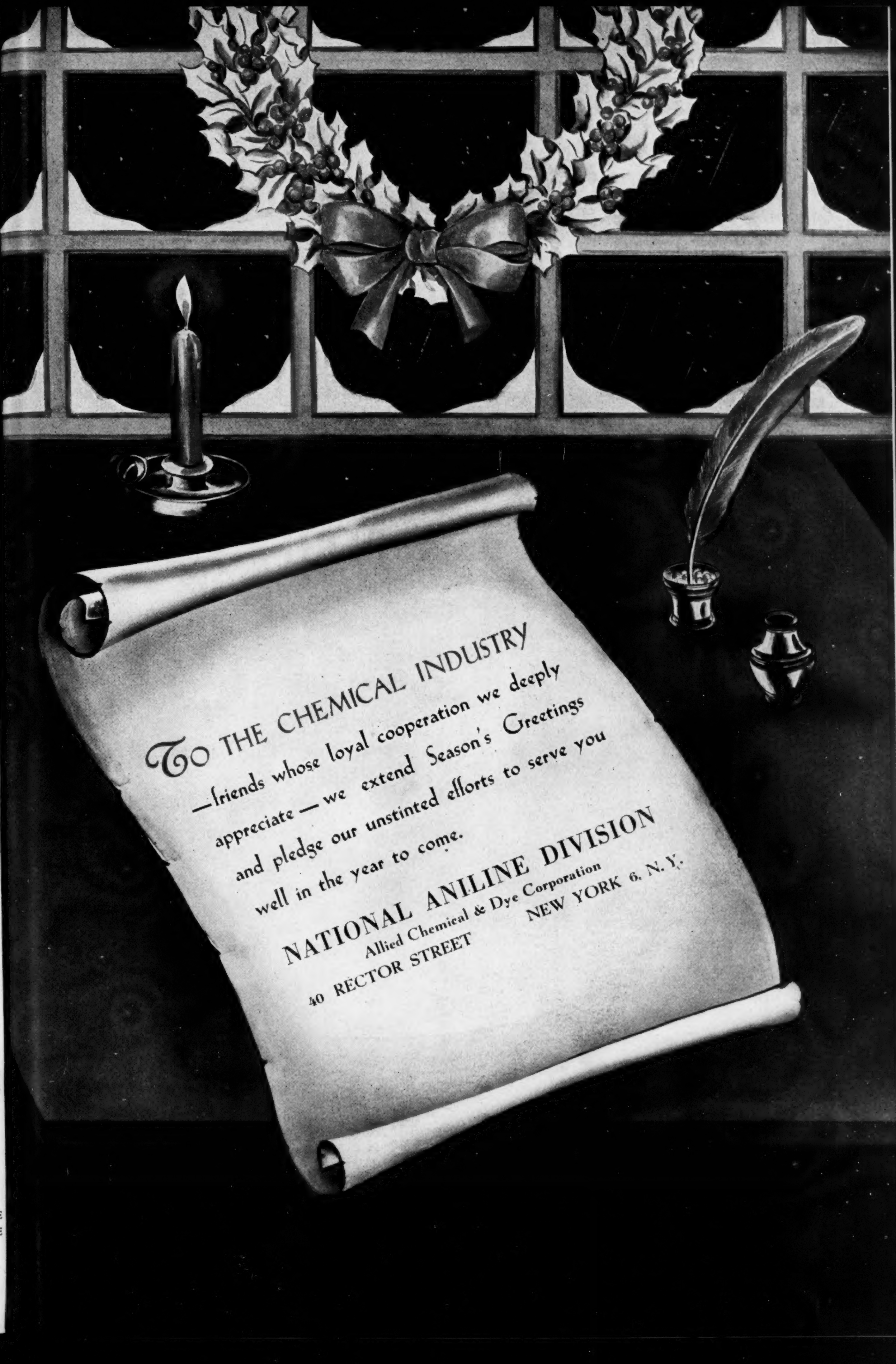


PHOTO FROM AMERICAN AIRLINES, INC.

(*Above*) **LEARNING CHEMISTRY WITH "DOMINOES."** Played as a game, vari-colored symbols (above, right) must be properly assembled domino-fashion as formulae to make a winning score. Originally a peacetime hobby, chemical dominoes now serve as a training aid for soldiers, such as those in the Chemical Warfare Service.

(*Left*) **READY FOR THE TAKE-OFF,** is this tableware molded of MELMAC* 1077, part of the table service on planes operated by American Airlines. Because it is exceptionally lightweight, strong and shatter-resistant, this plastic is widely chosen for such use. MELMAC 1077 is sanitary because of its hard, low moisture-absorbing surface and its resistance to staining. Now restricted, MELMAC 1077 can be produced in many beautiful, permanent colors, offering the designer opportunities for attractive product development. MELMAC is a member of the famous "family" of Cyanamid plastics made from melamine resin developed by the Research Laboratories of the American Cyanamid Company. Other diversified properties of these unusual plastic molding materials are great dielectric strength, high-heat and arc resistance, and high dimensional stability at both high and low temperatures . . . characteristics that have brought about the use of MELMAC for electrical applications such as ignition assemblies and insulation parts. MELMAC adhesives are also highly efficient for plywood bonding and paper or fabric impregnation.



To THE CHEMICAL INDUSTRY
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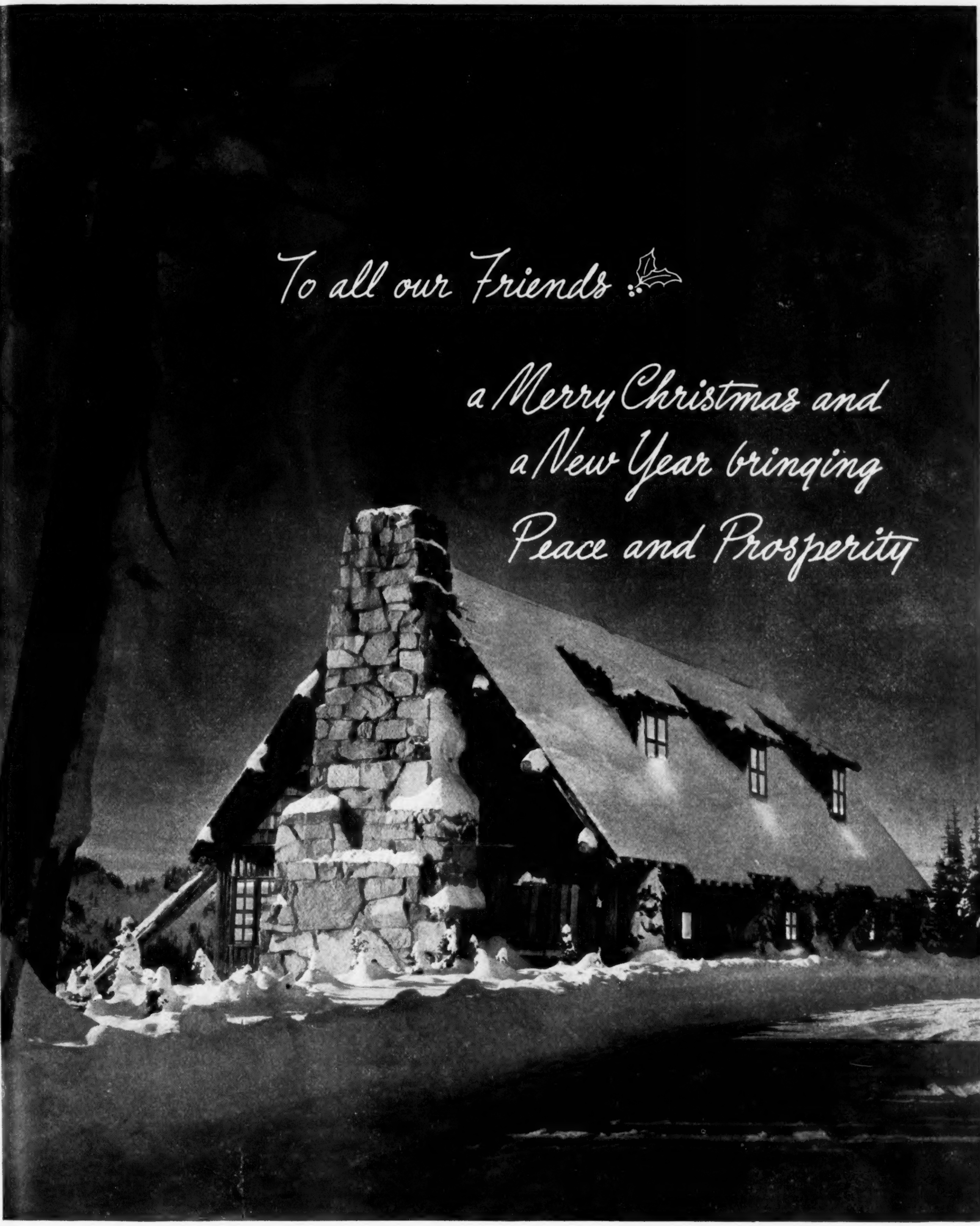
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a Merry Christmas and
a New Year bringing
Peace and Prosperity

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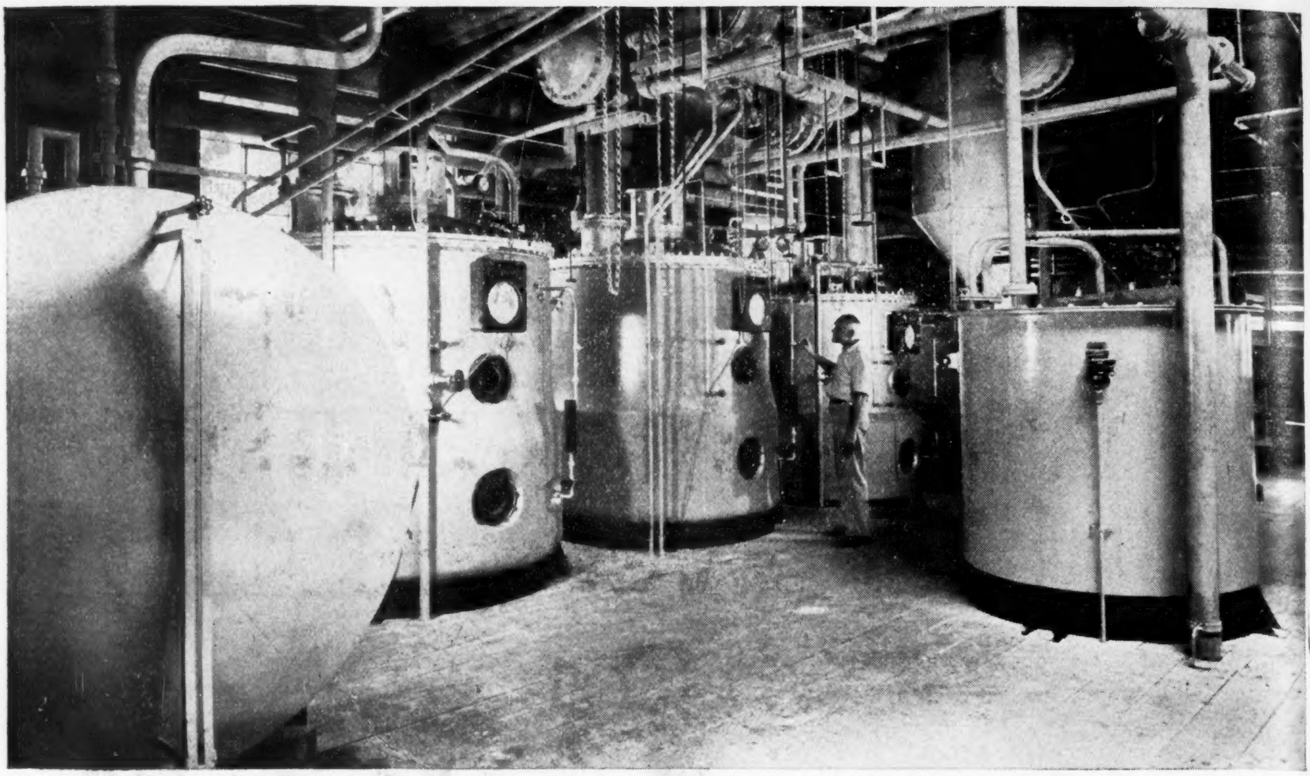

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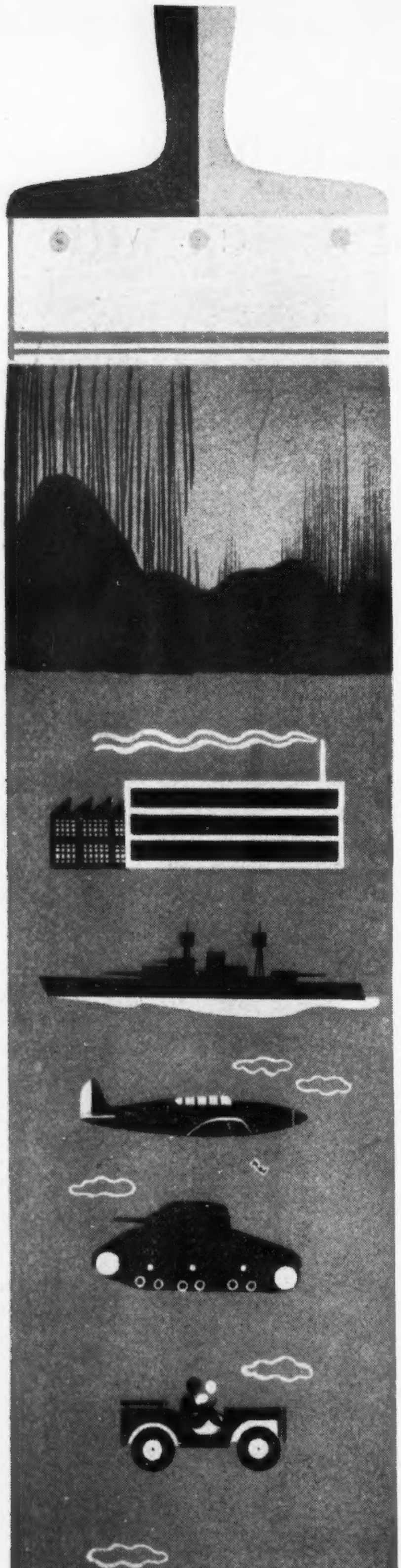

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1 ... or more ... cakes

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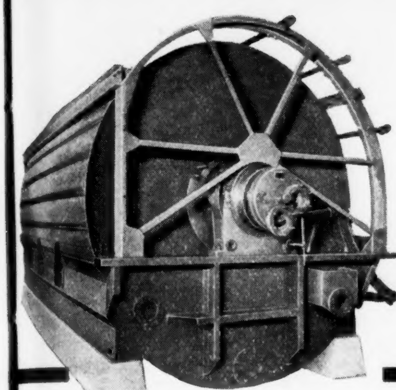

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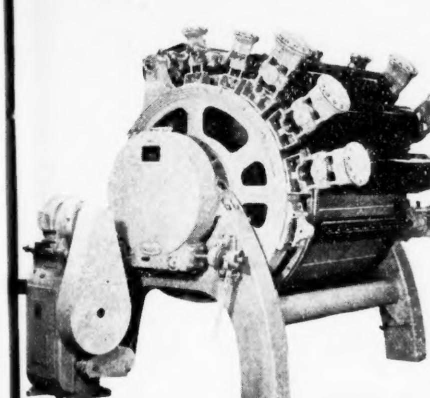

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Reg. U. S. Pat. Off.

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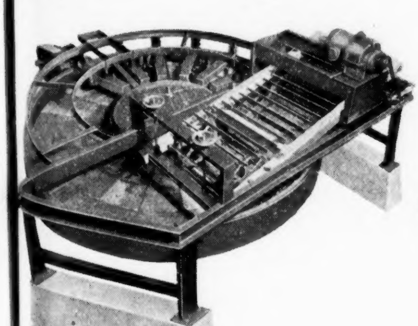

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We could list many other filters designed for special problems. The point is that we don't try to adopt a process to a filter. Rather we select a filter with operating features that will best take care of the problem. If no existing standard or existing modified unit is suitable, we design something different. To this important work we bring thirty-six years of experience and the knowledge gained from the performance of some 16,000 Oliver United Filters installed in process plants throughout the world.

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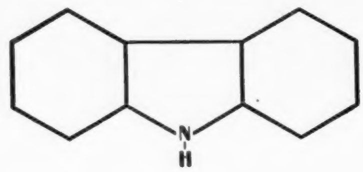

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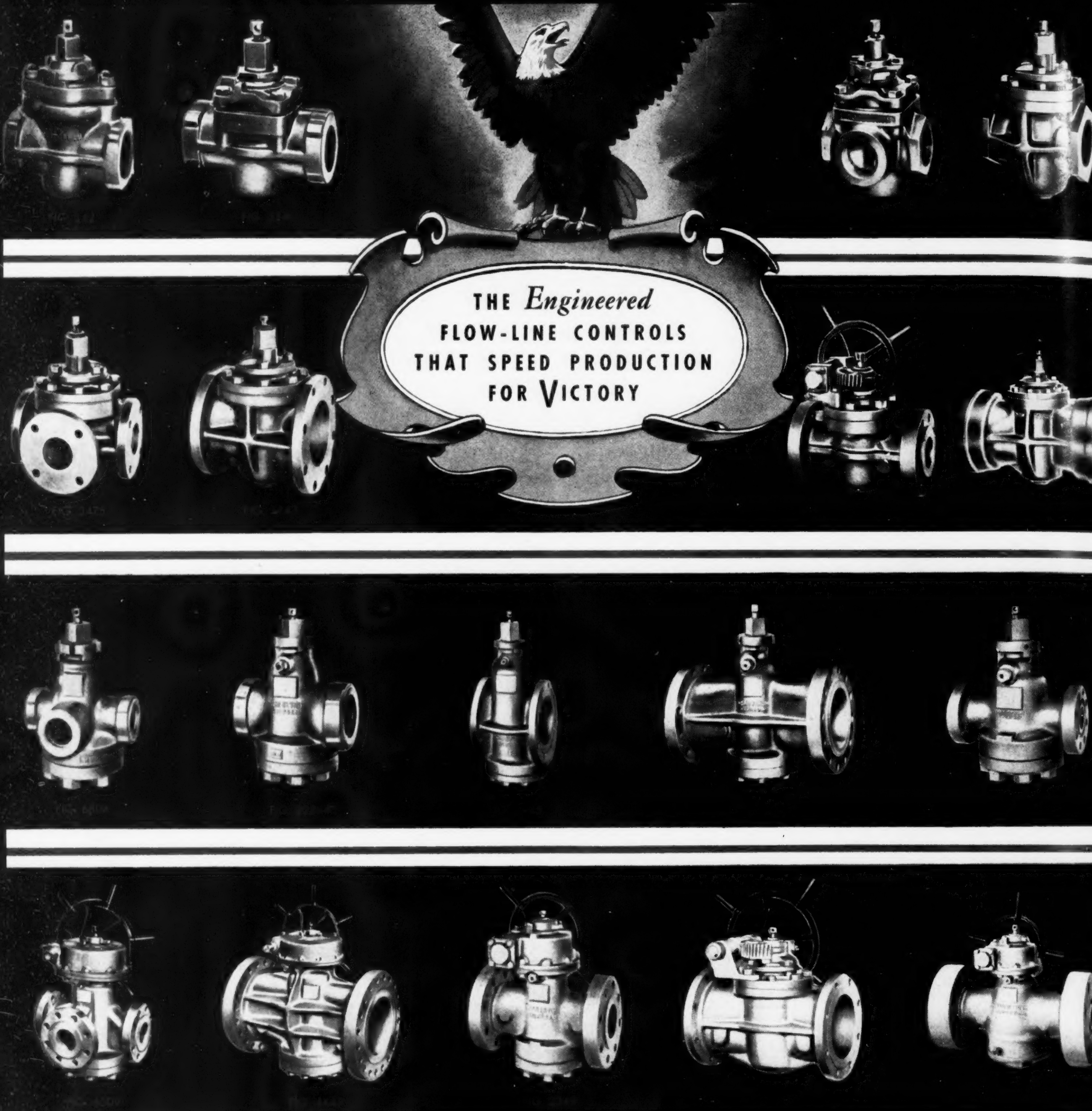

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MERCO NORDSTROM VALVE COMPANY — *A Subsidiary of Pittsburgh Equitable Meter Company*

WORLD'S LARGEST MANUFACTURERS OF LUBRICATED PLUG VALVES; GASOLINE, OIL & GREASE METERS

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Paratroopers
HAVE
HUSKY APPETITES


1944
'44—and the FUTURE
Business accepts as fact, that the future belongs to those who prepare for it. Most of us intend to prepare; the difficulty is, that we fail to convert our intentions into definite action, due perhaps to pressing current problems that take up so many working hours.
If your plans for the coming year include the consumption of any of our products, we suggest that you convert these plans into commitments at the earliest possible moment so that we can arrange our manufacturing facilities to fulfill your requirements. Here at Industrial Chemical Sales we have worked hard—and long during 1943 to produce a goodly supply of our products and we will keep at it just as diligently during the coming year.
ACTIVE NUCHAR CARBON
Nuchar Active Carbons ★ Abietic Acid
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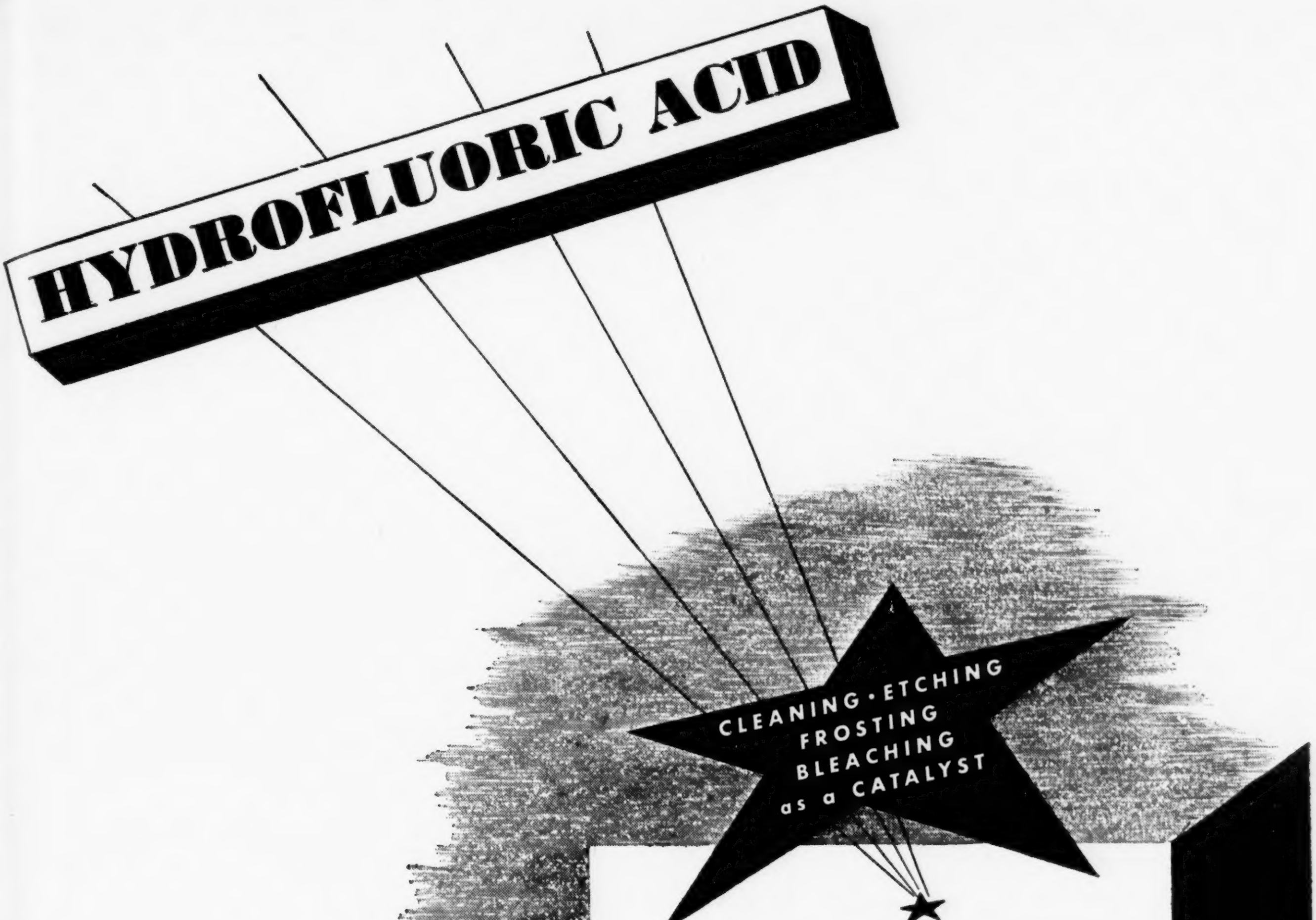
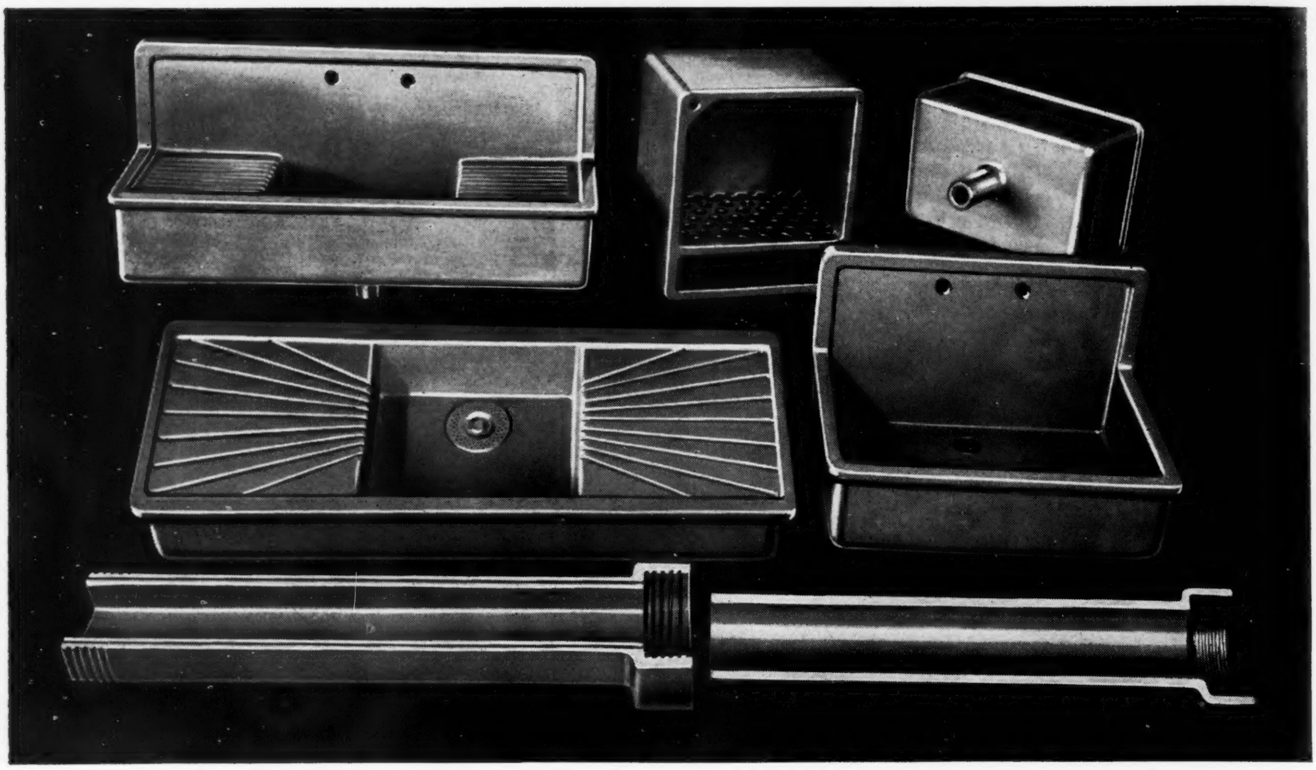

HYDROFLUORIC ACID
CLEANING • ETCHING
FROSTING
BLEACHING
as a CATALYST



Custom-Built Laboratory Equipment

No forms or molds are used to make acid-proof KNIGHT-WARE sinks. Each is specially built to meet your exact style and size requirements. There are no joints to be caulked or maintained, for each KNIGHT-WARE sink, its back, drainboard, apron and outlet is one solid piece.

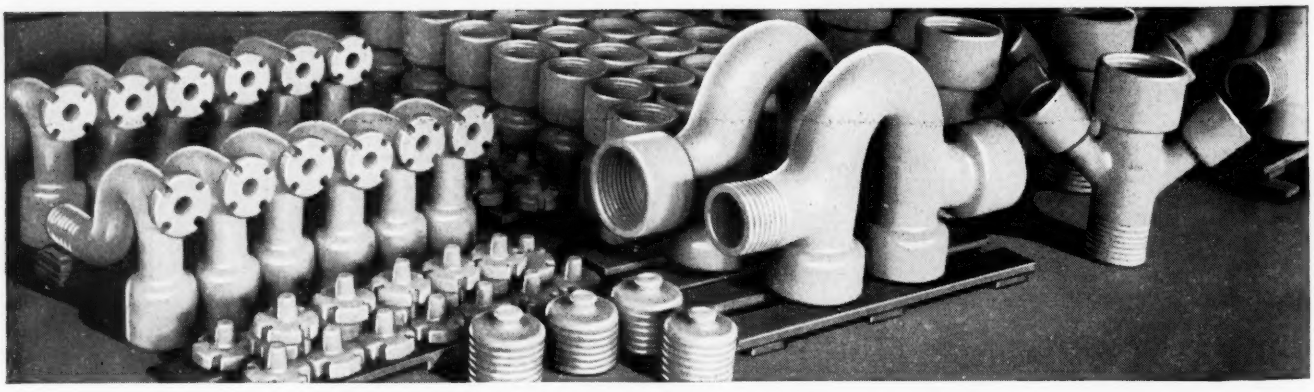
KNIGHT-WARE standard pipe and fittings are available for acid drain lines and fume ducts. Special fittings are readily made for difficult wall or floor situations. Other KNIGHT-WARE laboratory equipment such as table troughs, receptors and neutralizing sumps also help to give you a maintenance-free laboratory.

KNIGHT-WARE, a quality ceramic material, is entirely corrosion-proof throughout. The red brown finish is a fusion of the surface only for appearance, not an applied coating or glaze for acid protection.

Our engineers will help you plan and select permanent equipment. A copy of KNIGHT-WARE Laboratory Equipment catalog is yours for the asking.

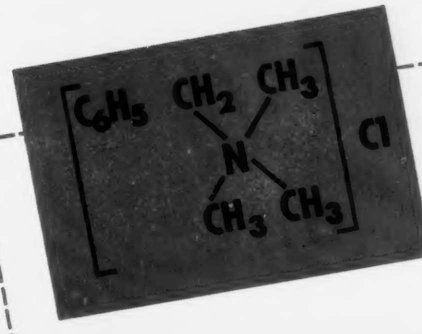
KNIGHT-WARE CHEMICAL EQUIPMENT

MAURICE A. KNIGHT
212 Kelley Ave. • Akron 9, Ohio



A New Material

with many useful properties



Benzyltrimethylammonium Chloride

If you need a quaternary ammonium salt, we recommend a thorough examination of this compound—its properties and reactions.

Anhydrous Benzyltrimethylammonium Chloride is stable up to approximately 137° C . . . but on further heating it decomposes to form benzyl chloride and trimethylamine. The anhydrous salt is extremely hygroscopic—hence Benzyltrimethylammonium Chloride is sold as a 60%-62% aqueous solution. It is now available in moderate drum quantities for essential uses. Samples will be supplied on request.

PROPERTIES OF BENZYLTRIMETHYLAMMONIUM CHLORIDE

IN PURE ANHYDROUS FORM:

Molecular Weight	185.7
Color	White
Melting Point	137.0°C, d
pH of 0.1 M aqueous solution, 25°C	5.4

IN 62% AQUEOUS SOLUTION:

Specific Gravity, 20°C/20°C	1.07
Refractive Index at 20°C	1.472
Freezing Point, °C	<—50
Viscosity, 25°C	6.36 centipoises

TABLE OF SOLUBILITIES:
(g. solute per 100 g. solvent)

Water	411
Ethanol, 95%	103.5
Butanol, C. S. C.	32.7
Dibutyl Phthalate	0.1
Tributyl Phosphate	0.1
Butyl Lactate	20.0
Ethyl Ether	Insoluble
Petroleum Ether	Insoluble
Benzene	Insoluble
Ethyl Acetate	Insoluble

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Through surf and mud, in jungle heat and arctic cold, rust preventatives keep our boys' death-dealing precision instruments at maximum lead-spitting efficiency.
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When this affair with Adolf's Super Race and Tojo's Sons of Heaven is ended – and it's coming fast – Nimco Brand Degras, Lanolin and other grades of wool greases will be available in abundance again.
Lanolin and Wool Greases Help Fight for Victory
BUY WAR BONDS
and support the fight
MALMSTROM NIMCO BRAND LANOLIN
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America's Largest Suppliers of
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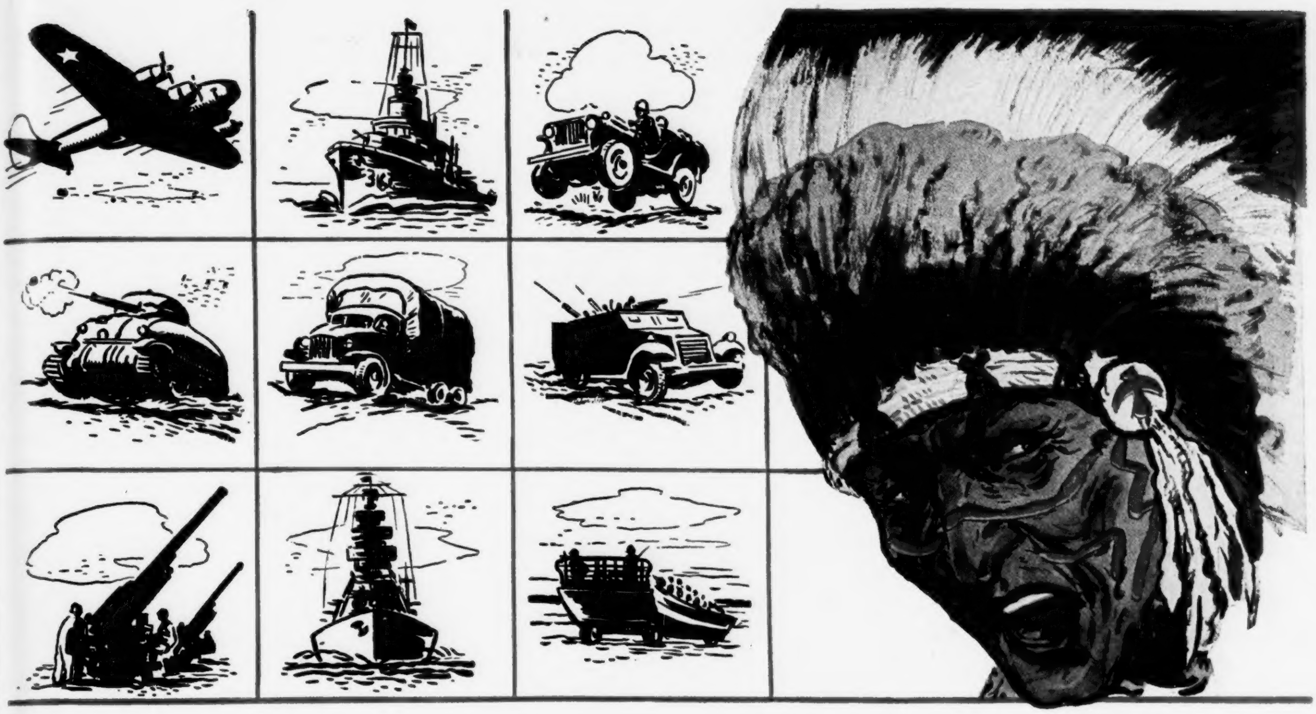

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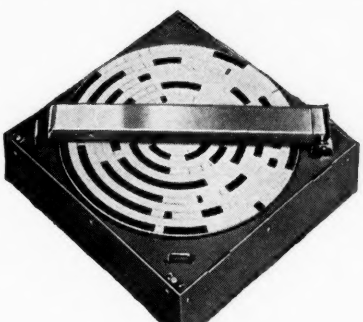
...and Service!



AUTOMATIC PROCESS CONTROL

This new development by the research laboratories of General Electronics Industries provides automatic control of chemical processes and also of production machinery, by means of printed charts which may be replaced or interchanged as readily as phonograph records.

● Jacks-of-all-trades have their place . . . but *not* in General Electronics Industries. Everyone in this organization, from top-flight research engineers to service men and their assistants, is an electronics specialist.

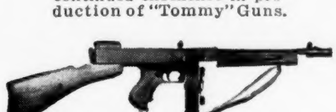
We have no miracle gadgets nor mysterious cure-alls for sale. Our business is the proper application of electronics to solve individual production problems. This begins with diagnosis, *follows through* with research, perhaps special design, and includes expert service before and after completion of the job.

To assist you in your post-war production planning, one of the largest organizations specializing in Electronics offers the skill, experience and unsurpassed facilities that have successfully met the most exacting tests of war.

Write to Engineering Department, General Electronics Industries, 342 West Putnam Avenue, Greenwich, Connecticut.

Other products manufactured include: **ELECTRONIC CONTROLS • VACUUM TUBES • HYDRAULIC SERVOS COMMERCIAL RADIO EQUIPMENT • ELECTROMECHANICAL DEVICES • ELECTROSTATIC HEATING UNITS UP TO 250 KW.**

ARMY-NAVY "E" WITH STAR awarded to Auto-Ordnance Corporation for continued excellence in production of "Tommy" Guns.



GENERAL Electronics INDUSTRIES

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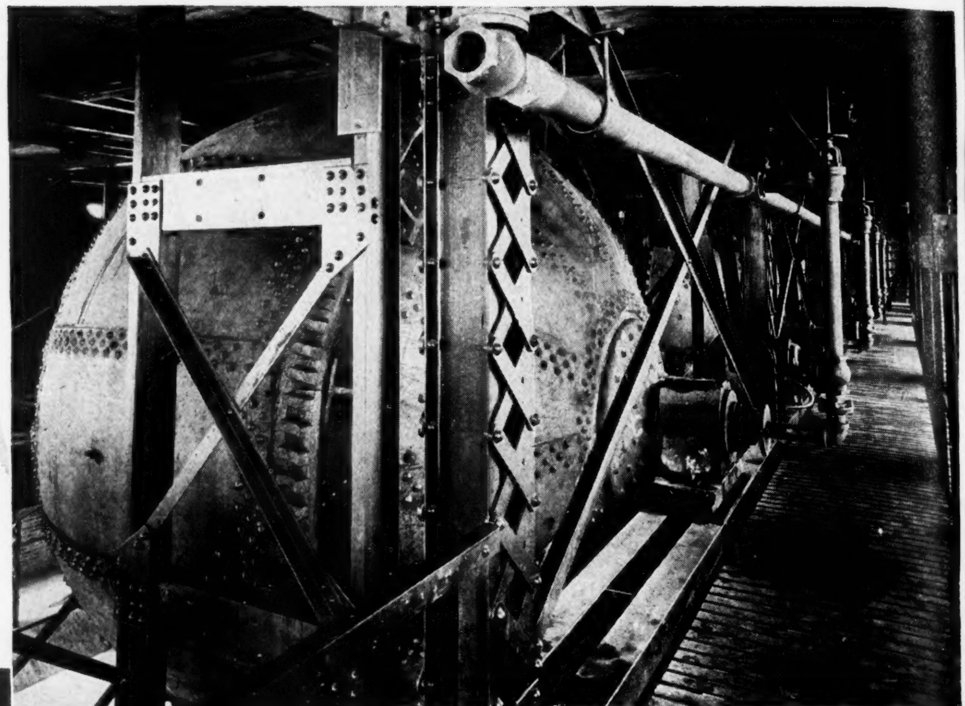
CLEANSING — DYEING — BONDING — NEUTRALIZING — PRECIPITATING — PURIFYING — BLEACHING — LUBRICATING — OXIDIZING — ABSORBING — CAUSTICIZING — CLARIFYING . .



Digester in straw-board mill, where Marblehead High Calcium Chemical Lime is used in cooking operations.

ONE OF THE MOST IMPORTANT REAGENTS IN INDUSTRY

MARBLEHEAD
High-Calcium
CHEMICAL LIME

Chemical lime enters in some manner into almost every important type of manufacturing, in which chemical reaction or physical action takes place. The impressive list includes such industries as STEEL, PAPER, BOXBOARD, WATER TREATMENT, LEATHER, FOOD PRODUCTS, PAINTS AND VARNISHES, TEXTILES, BRICKS, GREASES, GLASS, SUGAR, GLUE, RUBBER, DYE STUFFS, INSECTICIDES, CHEMICALS OF MANY KINDS, ETC.

Marblehead Chemical Lime has effectively served these and other industries for over 70 years, with consistent high calcium energy, uniform purity and utmost dependability.

With the finest high calcium limestone available from extensive quarries, manufactured under strict technical control by modern equipment and methods, Marblehead offers superior value, for any process, in speed of reaction, accuracy, high economy, steady reliability. Our four forms of lime provide a selection for the best application to your own needs.

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Editorial

vital STATISTICS

by ROBERT L. TAYLOR, editor

CHEMICAL INDUSTRY WELCOMED the announcement by Chairman Donald Nelson of the War Production Board last week that industrial statistics will once more be made publicly available and that new information including "figures on production or shipments, materials consumption, inventories and resources, fabricating capacity and utilization, employment, impending bottlenecks, new materials, substitutes, and general trends" will be released over the next few months. Deprived of most of their statistical tools since before the war, chemical manufacturers and distributors are glad to be able again to plan their present and future activities on the basis of something more than "guesstimates."

THERE IS AN OLD SAYING to the effect that deprivation makes appreciation. The chemical and allied products industries have been extremely fortunate in having the services of good statistical agencies—both governmental and others—run by capable men who understand not only statistics and statistical methods but also the business of making and marketing chemicals. No better evidence of this can be found than in the excellent and helpful figures on chemicals production and trade turned out every year up until the war, and now to be resumed, by the Department of the Census, Bureau of Mines, Tariff Commission, and Bureau of Foreign and Domestic Commerce.

It is of interest that the director of the chemical unit of the last named bureau, C. C. Concannon, has recently been loaned to the Chilean government as an advisor on chemical industrial development in that country. This is a personal honor to Mr. Concannon, but it is also a testimonial to the caliber of the men behind the chemical statistics of this country. It is after being deprived of the services and products of these men for awhile that we can fully realize the magnitude and importance of their contributions to chemical industrial progress.

NOW THAT CHEMICAL STATISTICS will be available again, it is to be hoped that the industry will make the fullest possible use of them.

In rapidly changing times like the present, it is more essential than ever that decisions be based on the best facts obtainable. Not only do experience and precedent count for less in such times, but a mistake in judgment may be much more costly than it would be under normal conditions.

There is also this matter of the bigger and better economic planning that the country seems to be moving toward today. If industry—the chemical industry—is going to carry its share, as it must if it wishes to keep from being engulfed in the tide of plans and procedures that otherwise are sure to come tumbling out of Washington, it is essential that it make use of all the facts at its disposal. Although the majority of chemical companies have always been convinced of the value of accurate planning for the future and have had persons on their staffs responsible for such work, many within the last few months have been placing greater emphasis than usual on this function and have been assigning more and better personnel to the job. Not only economic but sociological factors are being taken into consideration, and statistics on employment, distribution of population, wage rates and living costs are taking their place along with production and consumption figures among the statistical tools of chemical companies. It is interesting and significant that the postwar planning chart of one chemical manufacturer, as reproduced on page 837 of this issue, is laid out in terms of people as well as dollars.

WHETHER THEY CONCERN an individual company or product or an industry or nation, statistics are the basis of all industrial planning. They are the shifting foundation on which all forecasting and budgeting must rest. More than that, they are one of the distinguishing characteristics of democracies and the democratic way of doing business. It is a well known fact that national statistics are among the first things to be taken over or suppressed when a dictator government comes into power, for without the guidance of reliable facts, private industry cannot exist as such.

The announcement of resumption of statistical services by the government is therefore of great importance to the chemical industry and all industry. Additional word to the effect that the information to be supplied may far exceed in scope that which was formerly available in peacetime is also welcome, pro-

vided of course that it is of genuine value, and there is reason to believe that it will be.

Technical Manpower Blow

THE PRESIDENT this month signed the draft bill which puts pre-Pearl Harbor fathers at the bottom of the induction lists, thus dealing what will probably be a serious blow to deferments granted solely on occupational grounds. The measure requires reviews of present occupational deferments by appeal boards and abolishes the War Manpower Commission's list of "non-deferrable" occupations. Although deferments of non-pre-Pearl Harbor fathers on occupational grounds are not specifically ruled out by the bill, they are made much more difficult to obtain, whereas in the case of fathers the memoranda to local selective service boards state that the applicable instructions should be "liberally construed."

A literal interpretation of this bill by local boards, in which authority still rests, can have serious consequences in the chemical industry. Although numerically small, there are still enough non-father chemists and chemical engineers in essential war production jobs in chemical plants to leave an irreplaceable gap if they are removed. It is extremely doubtful that the industry will be able to meet increased 1944 war demands, or even maintain its present rate of production, if it must sustain any appreciable further loss of its occupationally deferred technical men. Presumably the bill will also cut off all replacements from the colleges, so that the situation in the industry can be expected to grow progressively worse instead of better.

The new bill means that the chemical industry is going to have to fight harder to keep its non-father technical men. Companies who do not already have a capable first-line executive in charge of such matters are going to have to put one on the job or run the risk of losing some essential men that they will find it impossible to replace. The problem is a serious one and deserves priority attention from top management.

Role of the Uncommon Man

IF ANYBODY ever had any doubts about the ability of this nation to produce enough food and goods to fulfill the needs of its citizens, those doubts have been dispelled by now. After the performance of the last three years there is no question about our producing ability.

So by simple elimination our number one postwar problem, insofar as caring for 140 million people is concerned, becomes one of distribution, a job of getting distributed among the 140 millions the food, clothing and shelter that they are fully capable of producing.

How successful we are in carrying out this job, according to John K. Jessup, chairman of the committee on postwar planning of Time, Inc., is going to depend on a class of individuals that Mr. Jessup calls "uncommon men."

"Whatever else the government can do for our economy," said Mr. Jessup in an address before the Boston Conference on Distribution this fall, "it cannot solve the distribution problem, or provide us with a moral substitute for war. The only man who can enlarge demand is the creative individual who has the imagination to think up new wants and so generate new wants in others. The uncommon individual has a vital and indispensable rôle in the century of the common man. It is he who keeps the common man's horizon expanding.

"By the uncommon individual I do not mean the man of privilege or the director of many corporations. I mean the man who brings something new into the world of goods and services, where it can be tested in a free market and added to the satisfactions of the people. Given a reasonably full and stable use of our basic resources, he is the only man who can maintain and increase employment by enlarging demand."

We like Mr. Jessup's point and the way he has stated it. We also know quite a number of uncommon men, many of them in the chemical and allied industries, and we can say with Mr. Jessup that if these men and others like them are given encouragement, if tax, anti-trust and other policies are designed to bring them out, they will come out. They will compete and take risks, make money and lose it, and keep the American economy growing and alive. They will also keep our class structure fluid and mobile and democratic. Even in the economic sphere, individual freedom is still America's best hope.

A Bad Safety Record

THE NATIONAL SAFETY COUNCIL'S final report on accident rates in the chemical industry in 1942, just made available, presents a bad showing even for wartime. From 1941 to 1942 accident frequency in the chemical industry went up 26 per cent while all industry decreased 2 per cent. Severity increased 40 per cent in the chemical industry as against 3 per cent for all industry.

There is no such thing as a justifiable accident. Green employees, production pressure and makeshift equipment may be causes of these high wartime accident rates, but they are not justification for them. They simply mean that more and continuous emphasis must be put on safety education. Employees are human and they forget if they are not constantly reminded, especially new employees.

It is significant that the most frequent unsafe practice involved in serious accidents in chemical plants was cleaning, repairing or otherwise working on moving equipment, pipe lines under pressure, or energized electrical equipment. In all of these instances mechanisal safety devices can go only so far in providing protection and the rest depends on the intelligence and caution exercised by the employee.

A triumph of industrial research—styrene towers at Velasco, Texas

Tools and Aims of Research

by JOHN J. GREBE, Director, Physical Research Laboratory, The Dow Chemical Co., Midland, Mich.

ON NOVEMBER 12, on the occasion of the presentation of the Chemical Industry Medal to Dr. John J. Grebe, there was delivered by the medallist one of the most stimulating and forward-looking addresses that the editors have had the privilege of hearing. A mixture of philosophy, sociology and workaday chemistry and physics, it was an expression by one who has thought much about the "why" and "whither" as well as the "what" and "how" of scientific and industrial progress. A few brief excerpts from the address are presented here.

Dr. Grebe came to America from Germany in 1914 at the age of 14 years. He attended the Case School of Applied Science, receiving the bachelor's and master's degrees in physics in 1924 and 1928 and the honorary doctorate in 1935.

THE MOST important asset for research is a good organization of competent men. Normally, we aim for 20% of our effort to go into the development of new facilities for doing research work, 50% to go into training men, and only 30% to go into doing the work at hand. This means that we allow the maximum of individual freedom and responsibility on the research front.

FARMING and manufacturing industries as a whole have produced from 3 to 6%

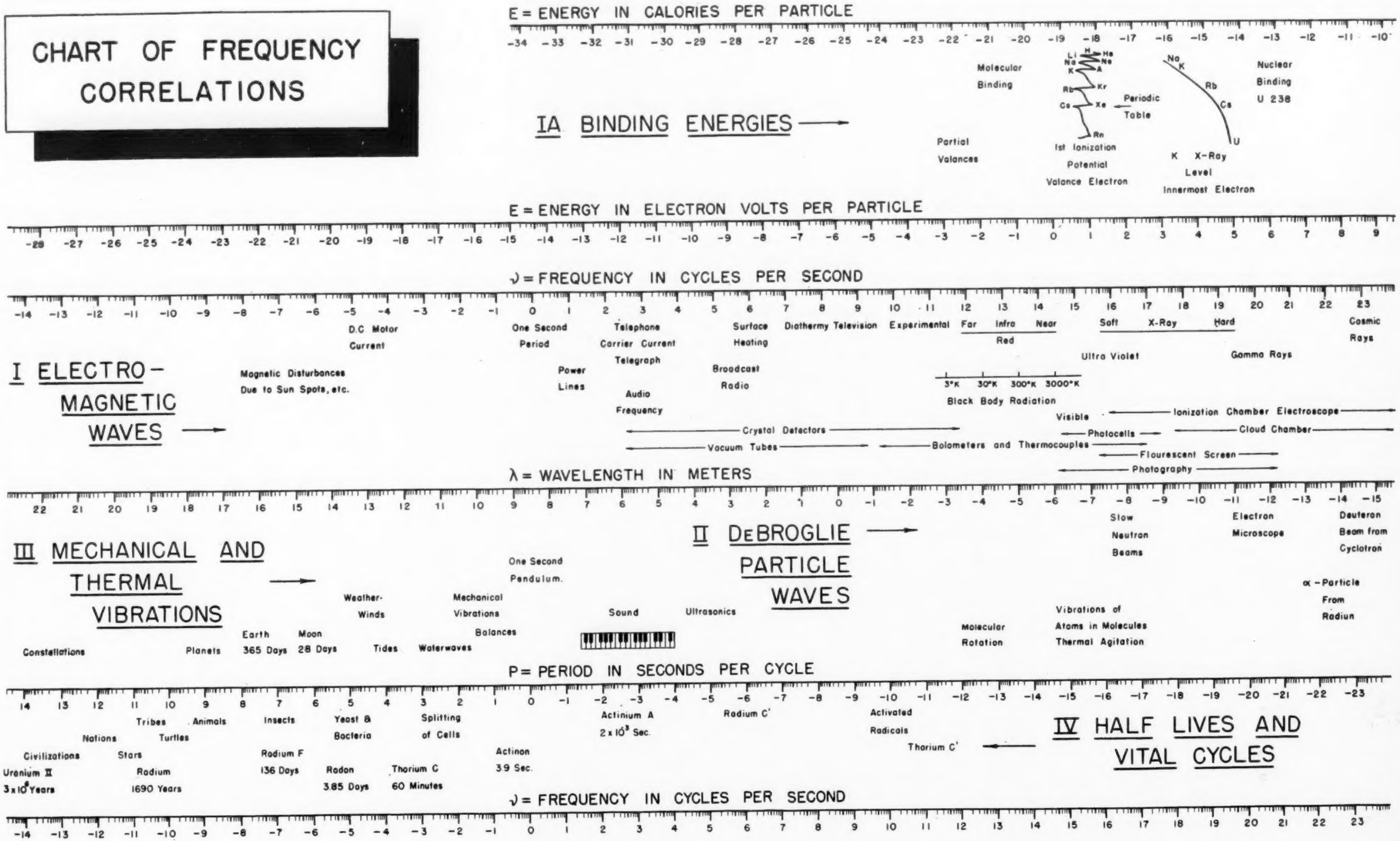


CHART OF FREQUENCY CORRELATIONS
E = ENERGY IN CALORIES PER PARTICLE
IA BINDING ENERGIES
Partial Valances
Molecular Binding
1st Ionization Potential Valance Electron
Periodic Table
K X-Ray Level Innermost Electron
Nuclear Binding U 238
E = ENERGY IN ELECTRON VOLTS PER PARTICLE
ν = FREQUENCY IN CYCLES PER SECOND
I ELECTRO-MAGNETIC WAVES
Magnetic Disturbances Due to Sun Spots, etc.
D.C. Motor Current
One Second Period
Power Lines
Telephone Carrier Current
Telegraph
Audio Frequency
Surface Heating
Broadcast Radio
Diathermy
Television
Experimental
Far Infra Near Red
Soft X-Ray Hard
Ultra Violet
Gamma Rays
Cosmic Rays
3°K 30°K 300°K 3000°K
Black Body Radiation
Visible
Crystal Detectors
Vacuum Tubes
Bolometers and Thermocouples
Photocells
Ionization Chamber Electroscope
Cloud Chamber
Flourescent Screen
Photography
λ = WAVELENGTH IN METERS
II DeBROGLIE PARTICLE WAVES
Slow Neutron Beams
Electron Microscope
Deuteron Beam from Cyclotron
α-Particle From Radiun
III MECHANICAL AND THERMAL VIBRATIONS
Constellations
Planets
Earth 365 Days
Moon 28 Days
Weather-Winds
Tides
Waterwaves
Mechanical Vibrations
Balances
One Second Pendulum.
Sound
Ultrasonics
Molecular Rotation
Vibrations of Atoms in Molecules Thermal Agitation
P = PERIOD IN SECONDS PER CYCLE
Uranium II 3x10^9 Years
Civilizations
Nations
Tribes
Stars
Radium 1690 Years
Turtles
Animals
Insects
Radium F 136 Days
Yeast & Bacteria
Radon 3.85 Days
Splitting of Cells
Thorium C 60 Minutes
Actinon 3.9 Sec.
Actinium A 2x10^3 Sec.
Radium C'
Activated Radicals
Thorium C'
IV HALF LIVES AND VITAL CYCLES
ν = FREQUENCY IN CYCLES PER SECOND

more each year with the same expenditure of human effort. The average productiveness of technical and scientific work has advanced still more rapidly. So, if research is to give us the satisfaction of a great adventure we must work with better tools and even better methods than our competitors. Enough research men doing this sort of work successfully can make it possible for us to improve the tools for research, production, and living sufficiently to outbuild the destruction of war.

QUALITY, obtained by close control, is one of the most important factors of success in both laboratory research and industrial production. The very first application of a sensitive electrometric measurement for automatic control that I attempted was an utter failure. We wanted a very accurate control of the addition of chlorine to brine to liberate the 0.13% of bromine. We used what is now called single speed floating control, which can not help but produce continuous cycling. The frequency of these oscillations turned out to be approximately one cycle every ten minutes. What a sad picture! A sensitive new recorder gave us the instantaneous analysis and then we had to fight the problem of cycling! By 1930 we had successfully applied proportional speed floating and proportional position control to electrometric recorders, and had described the theory and methods of second derivative control. The combination of these three responses, as incorporated in the latest types of control equipment now commercially available, can tackle almost any control problem successfully.

YEARS OF EXPERIENCE in fighting cycling and vibrational fatigue failures makes one understand the difficulties. The major portion of all our technical and scientific activities have to do with cycling of all kinds.

When one learns to quit fighting cycles and heeds *The Woodpecker's Song*—"Come on and join his rhythm and let your heart beat with him"—the picture changes entirely. You can then have the satisfaction of a music director who takes a chaos of voices, pitches, timing, and intonation and brings it into a harmony and beauty that thrills us all. All the natural sciences deal with cycles of various frequencies which, if undesirable, should be understood and controlled at their inception, rather than fought with violent action after they are in full swing.

THE MOST GENERALLY KNOWN frequency spectrum is that of electromagnetic waves ranging all the way from the slow variations in the magnetic field of the earth due to sun spots through 60-cycle electrical power, radio, visible light, X-rays, and cosmic rays. This covers a period from one cycle every 10^{10} or 100,000 million seconds to a frequency of 10^{22} or 10,000 billion billion cycles per second.

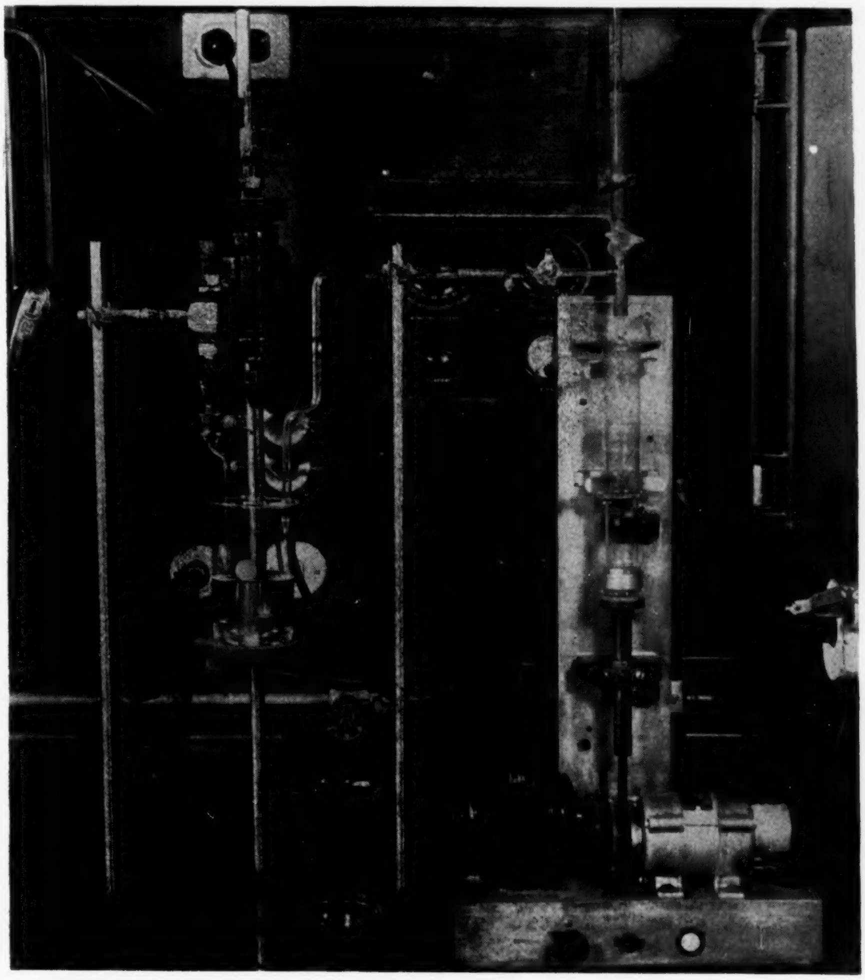
The second spectrum covers the de-Broglie matter waves associated with all matter, but of importance only when dealing with small particles, such as neutron, electron, proton, and helium beams.

Third, we have the kinetic spectrum of mechanical and thermal vibrations. This includes the motion of the heavenly bodies in their orbits, the daily cycles of our earth, the cycles of the tides, winds, and weather, the oscillations of an analytical balance, the whole range of sound vibrations, and thermal agitation, on up into the motion and vibration of neutrons.

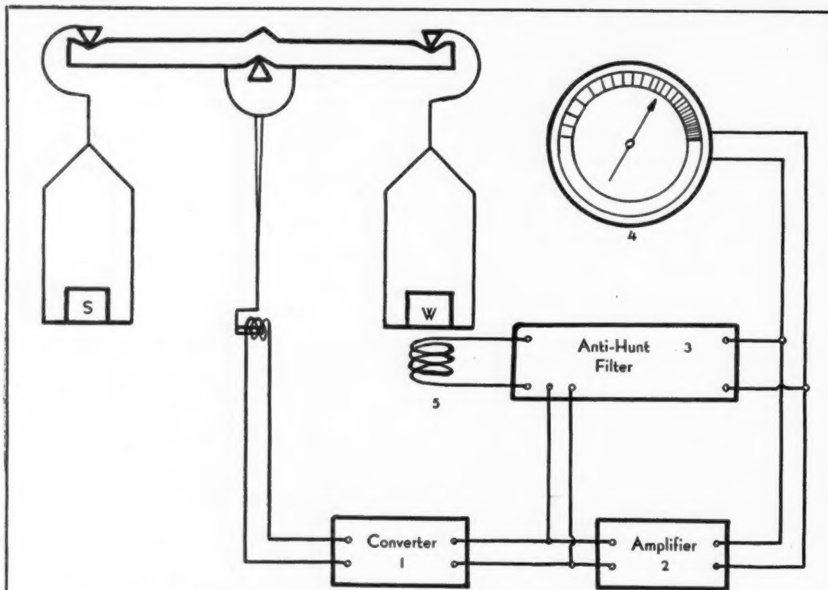
Fourth, we have the periods of discontinuous actions of matter, ranging from geological ages to the rise and fall of whole civilizations, nations, and the life cycles of man, insects, bacteria, yeasts, and individual cells. These are paralleled by the periods of activated atoms and molecules, as well as those of radio active elements. The latter range from a half period of 1.3 x 10^{10} or 10,000 million years for thorium to a half period of 10^{-11} or 1/100,000,000,000 of a second for thorium C′.

These charts (see opposite page) include a great many well-known correlations— the periodic table, the temperature scale, and the musical scale. Some day they may be augmented to the point where they will be considered the logical starting point for all education in the sciences.

MOST SOLID ELECTRICAL INSULATORS have been so deficient that air insulation was used wherever possible in power distributing systems. To eliminate the hazards of storms, sleet, and lightning, we can expect the adoption of buried coaxial cables. Each of these new cables can then be treated as a completely new pipe line for transmitting power and signals at all practical frequencies. When your house is connected to such a power line you will have piped to you not only the whole range of frequencies now available through the air and ground, but in addition the intermediate frequency range in which it is not easy to transmit enough power through space for various signal services. Just think! All your electric power, your telephone, telegraph, and



Automatic titrating machine governed by glass electrode for hydrogen ion determinations



1. Converter to change mechanical motion of pointer to electric current.
2. Amplifier.
3. Feedback filter for anti-hunt, adjusted to permit slight oscillation.
4. Logarithmic meter to measure weight.
5. Solenoid to apply balancing force.

Analytical balance employing feed-back principle

emergency alarms can be tied in with a central office. Your cooking and baking current will come to you at a frequency of about 100,000,000 cycles per second.

THE MOST IMPORTANT STEP in the direction of modernizing homes will have to be the production of a complete home machinery unit that can be delivered in the assembled form. These units will contain all the electrical, mechanical, and plumbing facilities for the house, coordinated in such a way as to take full advantage of all the energy available. They will contain all the refrigerating, cooking, water-softening, washing, and drying facilities now installed as accessories. They will have the complete heating, lighting, ventilating, and cooling systems. These units will have a really practical fireplace, a radio, television and sound film projector.

The energy coming into this home machinery unit through a concentric power distribution cable will be brought in at a high voltage. Any conversion of this power to other forms of energy is accompanied by losses. There is enough need for low level, high entrophy energy in the house, however, that most of these losses can be recovered in a useful form, such as for water heating.

THE MOST VALUABLE TOOLS of research to me have been those dealing with electrometric measurements by means of which we study oxidation and reduction reactions, ion concentrations, polarographic determinations, and electrical conductivity. It was the experience with these tools that permitted us to discover the possibility of recovering bromine from sea water, and to improve the methods of recovering magnesium from sea water.

So much of this work is being done that we have found it desirable to build automatic titrating machines giving us a complete graphical record of a titration ready for blueprinting or photostating, without the laborious job of recording and plotting data. A polarograph which produces a complete voltage sweep on each drop of mercury has also been developed so that titrations and blowing out experiments can be carried on while obtaining a continuous record of the operations. (See illustration on previous page.)

ONE VERY GRATIFYING RESULT of these new developments (in automatic control) should be the reduction of the endless chore of weighing on analytical balances, a detail which occupies so much of the time of analytical chemists. By the use of the negative feed-back principle, a balance with vacuum tube equipment should be extremely rugged, accurate, and fast, even with a ten second period. The modernization of our present balances should be a wartime "must" wherever more than one balance is kept busy. Why let things swing between extremes to find out the balance point when good control never permits a large deflection?

ANOTHER INTERESTING APPLICATION of the control of cycles is to locate some natural period corresponding to the one you wish to use for one of your operations and then adapt it to your problem. For example, in connection with our oil well acidizing, it was desired to prevent acid from going into previously enlarged pores which had given up most of their oil. Instead, we wanted to reach other pores leading to oil that had not been tapped, except for slight leakage. To accomplish this, we needed a very temporary cement—something that would go into the well as a liquid and set into a tough, strong plug for the open pores into which the first flow penetrates. Then, after setting and a high pressure acid treatment we wanted the cement in the large original pores to disintegrate and again permit the normal flow of oil and gas.

That seemed like asking for a little too much. But, in Section IV on our frequency chart, among the periods of life cycles, we were reminded that there are a great variety of yeasts and bacteria that might time things for us. So the search was on! Out of a large number we finally selected a few bacteria that were resistant enough to live and work under the conditions in oil wells, under high pressure and often in the presence of hydrogen sulfide gas. They go into the well with a gel forming starch powder which sets into a firm pudding which is then eaten up in due time by our bacteria. They have been working for us faithfully ever since. Many a well, abandoned for lack of production, has been given a new lease on life by this treatment.

NOW LET ME SHOCK YOU by advocating a new research in the direction of much older and more common tools—the shovel, the axe, the saw, and the bow and arrow. Here is the reason. As we go on increasing the productivity of man through higher grade machinery, our entire system of living will become increasingly vulnerable to internal and external attack. There is no way of avoiding this for we must be as efficient as possible in order to maintain our position. The primitive portions of the world will also become industrialized. So, a portion of the extra leisure we will earn will have to be spent in getting closer to the soil—getting closer to a life without machine tools and transported vital raw materials. The example of the Yugoslav and Chinese people in this war should convince us of the value of such an ounce of prevention.

FINALLY, the advancing outposts of science, correlations such as the frequency chart, and the increasing efficiency of the educational processes are showing us the beautiful unity and harmony of Nature. Who then wants to fight her rather than work and live in tune with her? There is a real joy and satisfaction for all of us in knowing that we are a part of Nature and that we live in a nation in which we are free to search out her secrets and are privileged to apply these in building a better life.

Capital Requirement Chart A Useful Planning Tool

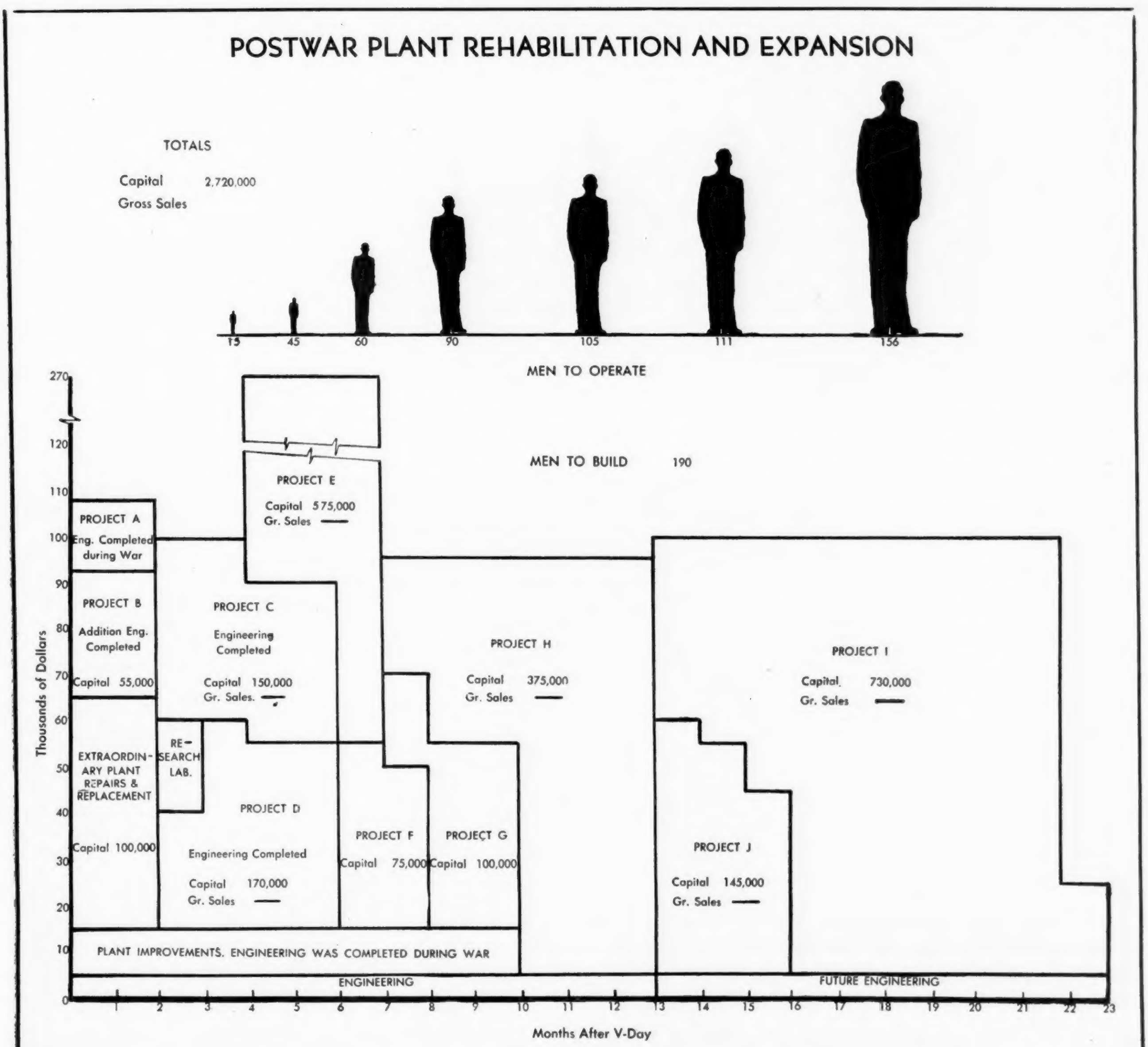
IN AN EFFORT to draft a specific postwar map of action that would go beyond the generalities so prevalent in much of this kind of planning today, a leading chemical company which has asked to remain anonymous has devised the Postwar Plant Rehabilitation and Expansion chart shown below.

Plotting capital requirements per month versus number of months after V-day, the chart shows at a glance how much capital will be required per month for accumulated repair and maintenance work, replacement of capital equipment, construction of new expansion, and similar projects. Along the top of the chart is shown cumulative manpower requirements at various stages as the program progresses.

The chart is based on data submitted by various departments of the company as to their anticipated requirements over the two year period, both for projects within the departments themselves, such as building repairs in the case of the operating department, and for broader projects handed down by top management such as construction of a plant for a new product, which would involve research and engineering as well as operating department expenditures. This departmental data is accompanied by estimated time schedules for each project. A central committee then coordinates the information into a chart like the one below, budgeting manpower and working capital and giving precedence to the most important projects. The result is an orderly schedule of construction which presents quickly and accurately the overall picture at any given time as well as the place of each individual project in the overall.

The chart is used to schedule presently foreseeable projects only and is revised and extended regularly as new ones come along.

The company that devised the chart uses one for each division and department and combines these in a master chart for the entire company.



CANADA as a CONSUMER OF

FOLLOWING HIS STUDY last month of Canada as a producer of chemicals, Mr. Jordan now reports on consumption of chemicals in the Dominion and the relative proportion of imports to total consumption. Recent years have witnessed a growing trend in Canada away from exportation of her raw materials and toward building of home industry to convert these into manufactured articles, a development resulting in marked increase in chemical consumption.

CANADA, in an industrial sense, is a young, rapidly growing nation which in the past few years particularly has undergone substantial transformation from an agricultural country to one possessing considerable manufacturing capacity. Since 1939 the dollar value output of Canadian factories has almost tripled and the demand for industrial and processing chemicals has advanced correspondingly.

Canada produces roughly one-half of her own chemical requirements. The remainder, in the main, are imported from the U. S. A. In a preceding article on the chemical producing facilities of the Dominion a rather complete list of Canadian-made chemicals was given. This included the major heavy chemicals and those items which do not require too highly manufactured raw materials.

To appreciate Canada's status as a consumer of chemicals it is necessary to consider the nation's industrial nature, the character of her resources, and the producing trends and extent of her industries. It is the purpose of this article to outline a few of the highlights of these aspects that are of chemical significance.

The industrial economy of the Dominion has been established on the bounteous natural resources of its three and a half million square miles of territory. Agriculture, mining, and forestry form the basic foundation of the country's economy, and only in comparatively recent years have the secondary industries developed in any degree.

With extensive forest lands, covering 1.2 million square miles, it is natural that pulp and paper production is the largest manufacturing industry of Canada. Normally, this industry, with capital of $679 million, is the largest industrial employer of labor, user of hydroelectric power, first in net value of production, and ranks high as a consumer of chemicals. Production has been shaded somewhat during the current year on account of labor shortages but is still some 27 per cent ahead of boomtime 1929.

Pulp and Paper

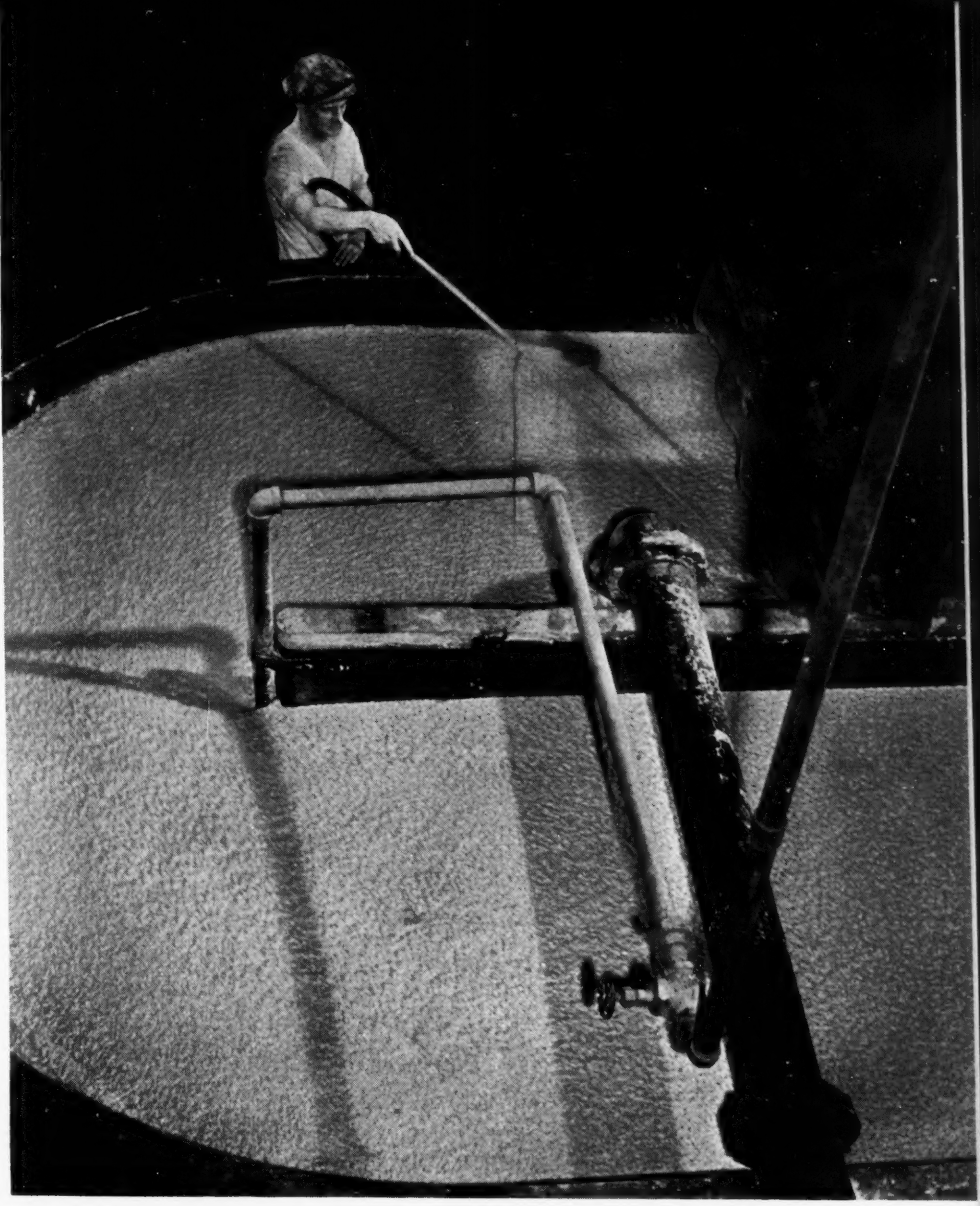
During 1942 the pulp and paper producers consumed $12.4 million worth of chemicals, of which $5.7 million was assigned to the purchase of 211,000 tons of sulfur. Sulfur importation presents a peculiar circumstance in Canada, for it is estimated that 900,000 tons of the element are potentially reclaimable from waste smelter gases annually. Nevertheless, only one unit operates in the Dominion for the production of elemental sulfur, and at least 200,000 tons of the 288,000 ton Canadian consumption is imported, normally by ocean freight from the Gulf.

Other major items consumed by the dominant pulp and paper industry include: 22,587 tons liquid chlorine, valued at a million dollars; 70,078 tons salt cake; 259,366 tons limestone; 158,630 tons lime; 15,000 tons caustic soda; and 1,120 tons talc. The miscellaneous chemical category totalling some 10,380 tons, valued at $1.2 million, no doubt embraces such materials as rosin, sizing compounds, dyestuffs and pigments, originating in the main in the U. S. A.

Increased production of foods for the Allied Nations, higher prices for farm produce, and the shortage of farm labor, have all greatly stimulated the use of fertilizers by Canada's $1½ billion agricultural industry. During 1942 domestic consumption of fertilizers, at 427,000 tons, was the highest in history, up 32 per cent over the preceding season. A very marked trend is evident toward expanded use of the so-called mixed fertilizers, rather than applications of single chemicals, and as a consequence advanced facilities for the compounding of such mixtures are located strategically across the country.

Nitro-cellulose washing and purifying vat.

CHEMICALS



Beating pulp in one of the world's largest pulp mills.

It is calculated that the tonnage mentioned above represents 14,353 tons nitrogen, 51,009 tons phosphoric acid, and 30,374 tons potash. Ninety-four per cent of fertilizer sold domestically is consumed in Central and Eastern Canada, with the West accounting for only six per cent of the total. Obviously, therein lies great possibilities for further expansion of fertilizer sales.

Total chemical consumption by the fertilizer companies approximates $10 million annually, and this group constitutes the largest single market for sulfuric acid, consuming 211,680 tons last year. Most of this acid is manufactured by the industry itself, largely by waste smelter gas reclamation.

Prior to the present war Canada imported heavy tonnages of Chilean nitrate, but at the present time war-engendered plants for the manufacture of synthetic ammonium nitrate are more than capable of accommodating all Canadian nitrate needs. Although ammonium nitrate has the lamentable property of caking badly, even in fertilizer mixtures, some success has been realized in the amelioration of this problem.

Potash supplies are rather limited at present, with an anticipated 20 per cent overall shortage for the crop year. Virtually all the phosphate rock consumed in the fertilizer industry, totalling 156,000 tons, is imported from either Florida or Montana.

Two other industrial activities rather closely associated with agriculture are meat packing and tanning. Added impetus has been given to the former since the outbreak of hostilities in view of Canada's food commitments to the United Kingdom. Last year 1,125,750 cwt. of salt was consumed by this industry, in addition to other chemicals valued at $325,000.

The tanning industry has followed a comparatively steady course for a number of years, with production from the 78 tanneries, capitalized at $28 million, recorded at $33.9 million in 1942. These tanneries consumed $2.1 million of tanning extracts during the year and an equivalent quantity of chemicals. A thousand tons of sodium bichromate, 6,000 tons lime, 8,000 tons salt, 1.850 tons sulfuric acid, 900 tons sodium sulfide, and 750 tons sodium hyposulfite are the chief items. Quebracho, chrome extract, and myrabolans comprise the heavy tonnage of the extract category, at 9,100 tons, 700 tons, and 600 tons, respectively.

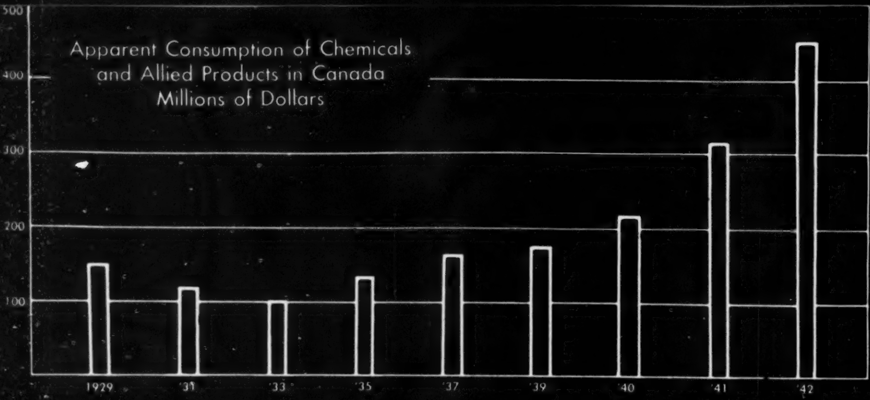
Mining

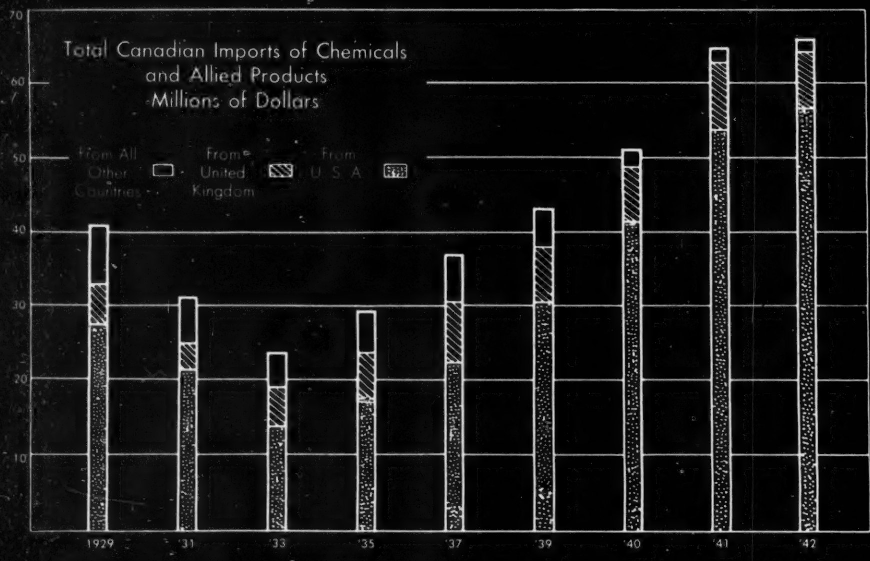
North of Canada's narrow population belt is a vast sparsely populated hinterland, stretching for hundreds of miles to the Arctic Circle. Therein are located the Dominion's world famous mining fields which yielded $564 million of mineral wealth last year.

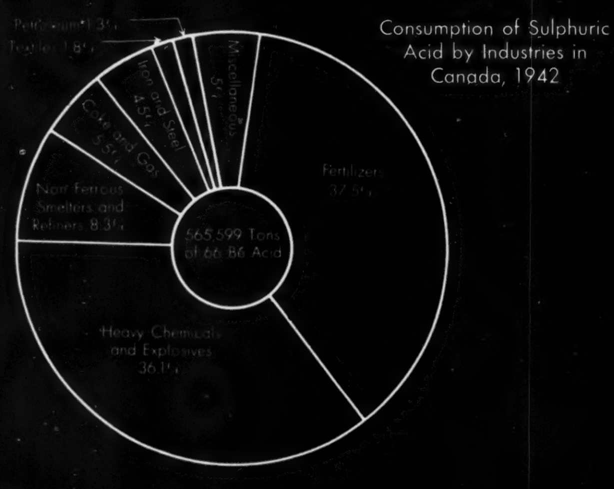
For years, gold has been the glamour metal, with Canada rated as second gold producing nation of the world. Today, output of the precious metal has been curtailed and labor diverted to the production of the utilitarian metals of war. Nevertheless, the gold mining activities of Canada's northland still consume some $21 million of processing supplies annually, mainly explosives and recovery chemicals.

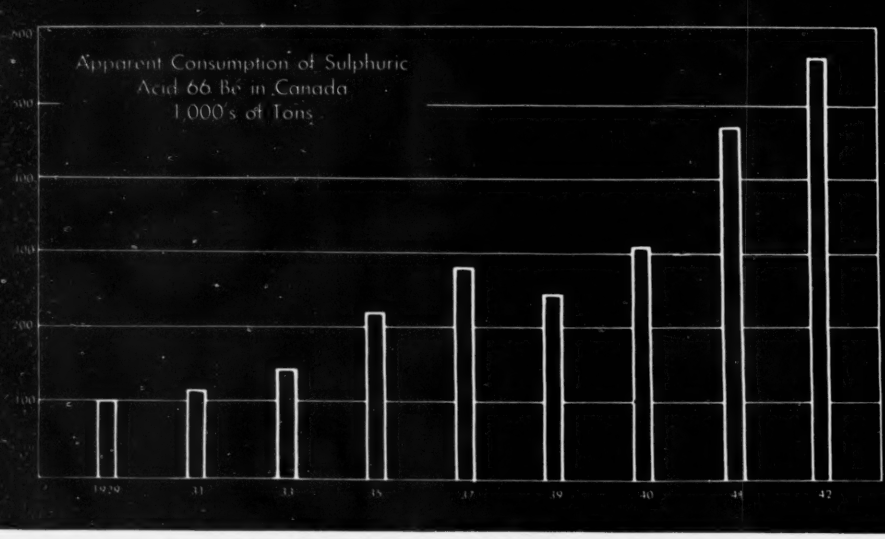
Today, Canada ranks as the world's greatest exporter of base metals, with production of copper, nickel, lead, and zinc evaluated at $167 million. In the past four years substantial expansion has taken place in base metal output, with refined copper up 16.7% over 1939 to stand at 270,600 tons; lead up 27.6% at 243,800 tons; zinc up 23% at 216,000 tons; and with the nickel industry geared to turn out some 125,000 tons this year. Aluminum units have been extended to a billion pounds per annum capacity. Magnesium, chromium, mercury, tungsten, molybdenum and tin are other prime products of the Dominion's metallic output.

These non-ferrous smelting and refining activities consumed more than $20 million of chemicals and processing supplies during the year. This total includes sizeable purchases of explosives, sulfuric









acid, soda ash, pine oil, xanthates, and flotation agents.

Mineral resources must be recognized as a wasting asset for it is axiomatic that ore once removed from the mine cannot be replaced. However, the use of aircraft has opened up a million square miles of untrammelled territory for the prospector, and recent discoveries have disclosed extensive mineral fields rich in potentialities. The mineral storehouse of Northern Canada is vast; exploitation has been relatively superficial. The trend of the metallic mineral industry in Canada should be one of gradual expansion for years yet to come.

Rubber Processing

Another industry of considerable importance to the industrial life of Canada is rubber processing, for the Dominion ranks high as a manufacturer of rubber goods. Normally, Canada is the sixth largest importer of crude rubber in the world. Latest data available indicate that this $72 million industry, producing goods valued at $119 million, consumes $6.3 million of chemicals annually. Twenty-six million pounds of carbon black constitutes the major purchase, at a factory cost of $1.3 million, with 13.5 million pounds of zinc oxide second on the list. The rubber processors consumed in addition 678,000 pounds of accelerators, 2,050 tons sulfur, 7,500 tons whiting, 800 tons barytes, and 1,000 tons talc. Miscellaneous chemical purchases totalled $2.9 million.

Of the foregoing, most of the accelerators are imported, for there is only one company, Naugatuck, producing such chemicals domestically. The bulk of the whiting is ordinarily imported from England, but in recent years increasing amounts have been brought in from the U. S. A. Most of the zinc oxide is made in Canada, with a probable 4 million pounds originating in America. The bulk of the barytes is shipped in from the Southern states.

At present, naturally, the industry is in a state of flux, with a complete change-over to synthetic rubber scheduled for January. What effect the replacement of natural by synthetic rubber will have on chemical consumption is still conjectural, for all processing formulations have not been irrevocably established at this writing. However, it is apparent that carbon black importations will increase many fold, together with asphaltum plasticizers and coumar resins. Indications are that inert filler consumption will be off some 80 per cent.

Protective Coatings

In spite of curtailment of civilian lines, the manufacturers of paints, pigments, and varnishes, reported output of $45.2 million

last year, with chemical purchases of $16.5 million. Some 70 chemicals comprise the major listing, ranging from acetone to xylol. Purchases in the million dollar bracket include; lithopone, china wood oil, synthetic resins, titanium oxide, linseed oils, and petroleum distillates. Chemicals of which the consumption value was between $250,000 and $500,000 are; white lead, nitrocellulose, resin driers, shellac, castor oil, perilla oil, ethyl alcohol, ethyl and butyl acetates.

The protective coating industry relies heavily on imports for many pigments, especially, carbon, bone, and lampblacks, earth colors, clays and fillers, talc, naval stores, synthetic resins, lithopone and whiting. With the exception of the last two the U. S. A. is the main source of supply.

Production of those plants occupied chiefly with the manufacture of medicinal and pharmaceutical preparations has increased 50% since 1939 to reach a record $40.9 million for 1942. The 169 factories in this group, capitalized at $34.3 million, consumed some $11 million of chemicals during the year. In view of the rather specialized and low tonnage requirements of this industry, it is apparent that imports form a sizeable proportion of the industry's purchases.

Ethyl alcohol heads the list of chemicals consumed at $410,929, followed by tartaric acid at $326,617. Other main purchases are cod liver oil $213.385; essential oils $219,440; mercury $173,566; acetylsalicylic acid 310,606 lbs.; citric acid 332,466 lbs.; white mineral oil 1,004,256 lbs.; and petrolatum 641,306 lbs. All the foregoing, with the exception of ethyl alcohol and cod liver oil, are American imports.

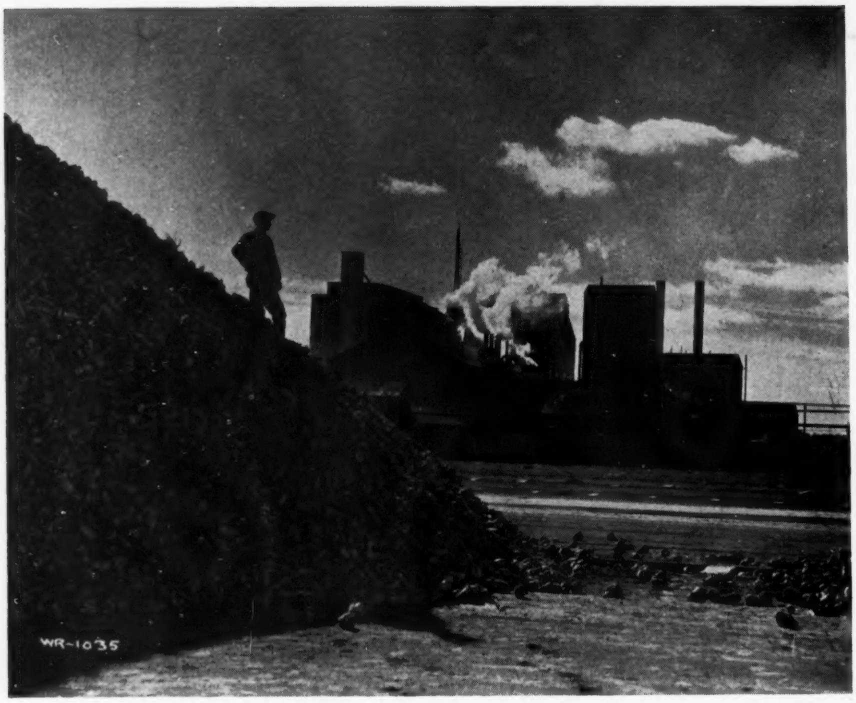
Forty per cent of the United Nations' bauxite comes from Canada.

Canada has a $2,000,000 textile industry.

Soap and Detergents

The soap and cleaning compound manufacturers, with capital employed of $20.5 million and output of $29.3 million, consume exactly one-half of Canada's 48.6 million pounds of caustic soda and 700,000 pounds of caustic potash. This industry utilizes in addition 17,000 tons of 40 degree sodium silicate, 5,400 tons soda ash, 3,000 tons salt, 700 tons liquid chlorine, 2,400 tons rosin, and 2,700 tons sodium phosphate. With the exception of rosin all the chemicals noted are made in Canada.

Several other industries, although individually they are not large chemical



A sugar refinery and beet pile.

Glass-making, a new Canadian industry.

consumers, collectively are of interest in view of fairly heavy importation of several chemicals.

The glass industry, for instance, imports 115,000 tons of silica annually from the U. S. A. The polish and dressings manufacturers import more than a million dollars worth of waxes, normally through American channels. The petroleum refiners consume $4 million of tetraethyl lead fluid, and the dyers and finishers of textiles account for dyes and chemicals worth $2 million.

During wartime a number of restrictions exist to limit the detailing of imports of individual chemicals, but a special compilation has been made to provide salient statistics under group headings. The latest figures released, for 1942, reveal that Canada imported $3.8 million worth of acids, $600,000 alcohols, $5.5 million drugs and kindred materials, $4.4 million cellulose products, $8.9 million dyeing and tanning materials, $800,000 explosives, $3.7 million fertilizers, $6.4 million paints and pigments, $12.5 million "inorganic chemicals," and $19.8 million other chemicals not otherwise classified. In all, this categorization totals $66.5 million compared with $42.7 million for 1939.

One feature is strikingly evident in surveying the consuming trends of Canadian industry, namely, even though domestic production of chemicals has soared in the past few years, imports too have climbed steadily. Thereby, the extent and rapidity of the Dominion's industrial growth may be appraised.

To predict is hazardous but certain facts lend themselves to logical extrapolation.

Future Requirements

Canada will enter the postwar world with greatly expanded and diversified manufacturing facilities, with the know-how of mass production, and raw materials and resources ample for continued industrial development. No longer will it be sound to regard 1935-1939 as "normal" years of Canadian commerce, for the war will leave indelible imprints on the nation's economic character. Canada stands, today, on the threshold of a new industrial era.

Agriculture will no doubt remain the fundamental economic backbone of the country, and with the West graduating from its one-crop position with heightened interest in oil bearing crops, a more stable agricultural domain should be established. Thereby will come into being an improvement in purchasing power and a closer liaison with industry.

In the past Canada has tended to exploit her mines and forests and export such raw material resources prolifically. Of late, much has been accomplished in respect to the creation of facilities to work up these raw materials into fully manufactured goods, with a consequent strengthening of the secondary manufacturing industries and a broadening of the Dominion's chemical requirements.

The forests of Canada, could, if properly managed, be a non-wasting and ever growing asset. With existing sources of abundant low cost power and the availability of the requisite large quantities of water, the pulp and paper industry should continue to prosper, even as it has in the highly competitive markets of the last decade. Blueprinted plans for future extension and diversification of the industry are already in being.

Realistic thinking dictates that there will be a curtailment of Canadian chemical consumption in the immediate postwar period, but after reconstruction and reorientation of productive resources has been completed, there is every justification for believing that Canada will emerge as a much more substantial manufacturing nation, and thereby a more important consumer of chemicals.

Glass Fibers Show Good Column Packing Characteristics

Bundle of glass fibers shaped to fit snugly in test column. Bundle is 20 inches high.

PERFORMANCE TESTS show glass fibers to possess all the characteristics of a satisfactory material for industrial packed column distillation work. Four such columns are now in commercial use in the alcohol industry; five more are planned.

USE OF glass fibers for packing in distillation columns is a comparatively new development that has grown out of demands for something to replace the tinned copper bubble plates generally used in alcohol columns before the war.

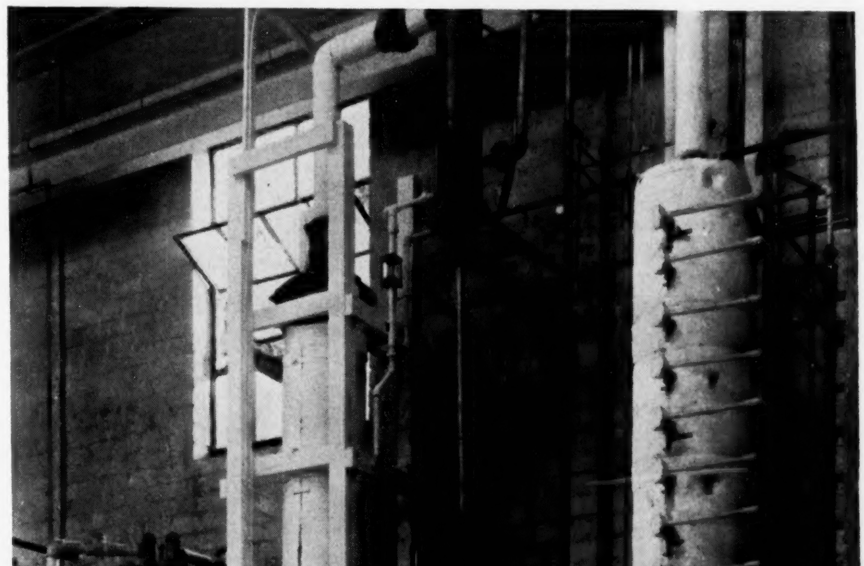
Glass fiber packed columns were first used a little over a year ago when two of them were put into the Peoria, Illinois, distillery of Hiram Walker and Sons, Inc. for operation on industrial alcohol. Since then, two have been put into use by the Tom Moore Distillery at Bardstown, Kentucky, and plans for construction of five more elsewhere in the industry are now reported.

The first generally available data on the operation and characteristics of such towers, however, was presented at the meeting of the American Institute of Chemical Engineers in Pittsburgh last month in a paper by Dr. Joseph H. Koffolt, professor of chemical engineering at Ohio State University, Dr. James R. Withrow, chairman of the chemical engineering department at Ohio State, and Dr. George W. Minard, assistant professor of chemical engineering at the University of Utah.

The paper was based on tests made in two 11¼-inch inside diameter laboratory columns, one 1.45 ft. high and the other 6.5 ft. high. The separation of three industrially important mixtures was studied: ethanol-water, methanol-water, and acetone-water.

The glass fibers employed in the test were relatively coarse, averaging 0.0098 in. dia. Length averaged 20 in. They were packed in the columns in a vertical position, parallel to the direction of vapor flow, and at a density of about 4 lbs. per cu. ft. Surface area of the packing in the shorter column was 153 sq. ft. and in the taller column 579 sq. ft.

Both columns were operated as rectifying and then as stripping sections, some 600 runs being made in all. Runs were repeated at intervals ranging from one day to ten months to determine whether the characteristics of the columns had changed with time. The results checked reasonably well, indicating good consist-



At the left is the larger of the two columns employed to obtain data on the performance of glass fibers used as column packing.

ency of behaviour and confirming observations made in industrial practice.

Discussing vapor velocity, an important factor in determining efficiency, Dr. Koffolt said, "A series of runs was made on the systems ethanol-water and methanol-water, in which the rate of through-put was varied from a mass velocity of 200 to 1,200 lbs. of vapor per hr. per sq. ft. of cross-sectional area, which was the limit of our steam capacity. This corresponded to varying the vapor velocity from 0.80 ft. to 5 ft. per sec.

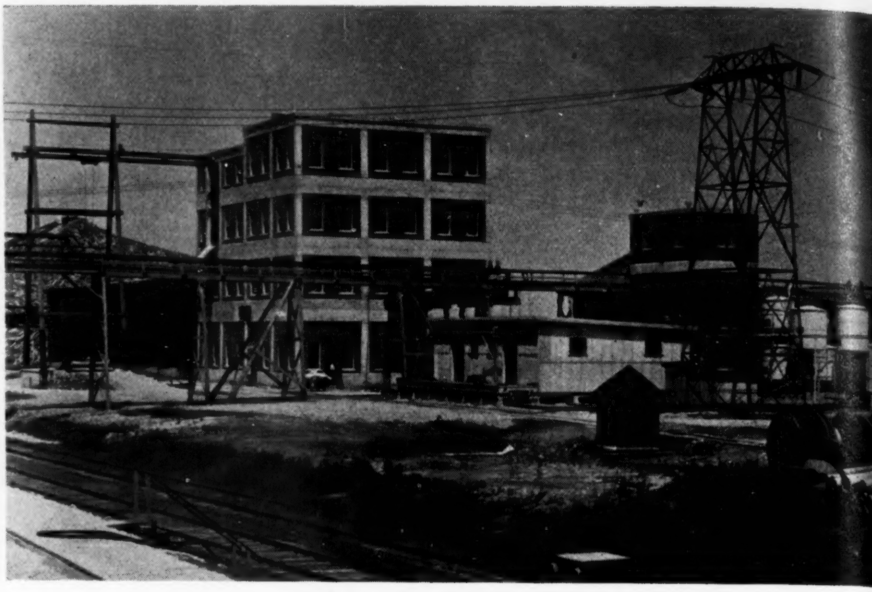
"Within the ranges investigated the rate of through-put had no appreciable effect on the performance characteristics of the packing. Pressure drop data indicated that higher rates of through-put than 5 ft. per sec. might be obtained."

Summarizing results of the investigation, Dr. Koffolt stated that glass fiber packing appears to possess all the characteristics of a satisfactory material for industrial packed column distillation work, including good rectifying performance, high rate of through-put with low pressure drop, low hold-up, consistent behaviour, light weight per unit volume, and low cost.

In contrast with the above, the two columns in commercial operation in the Tom Moore Distillery at Bardstown are 43 ft. high and have an inside diameter of 50 in. In each column there are four 7-foot glass fiber packed sections. The fibers are 0.0085 in. dia. and average 20 inches long. They are packed normal to the direction of vapor flow, however, instead of parallel as in the Ohio State columns. Density of packing is 3.7 lb. per cu. ft.

Rate of feed to the columns is 11,220 gal. per hr., and the amount of product taken per hour is 4,700 gal. Reflux is 2,300 to 2,400 gal. per hr. Vapor velocity is 5.5 ft. per sec. The alcohol produced is from 190.0 to 191.4 proof, with the greater part near the higher proof.

Placing glass fiber packing in alcohol distillation column at Tom Moore Distillery. Note fibers are placed crosswise of path of vapor flow.



Alcohol plant of the Ontario Paper Company at Thorold, Ontario

Alcohol From Sulfite Liquor

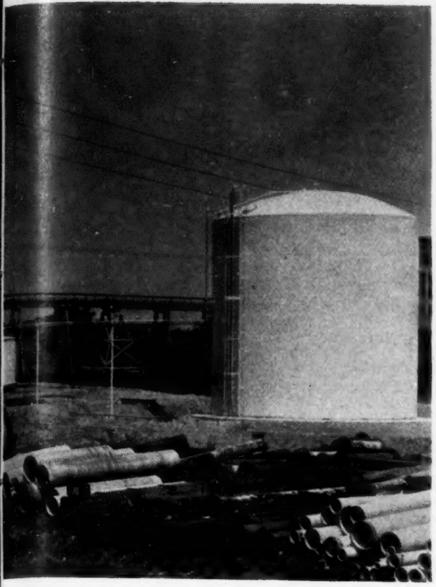
INDUSTRIAL ALCOHOL FROM PULP MILL WASTE is being produced in the new Thorold, Ontario, plant of the Ontario Paper Company at a cost of 19 cents per U. S. gallon plus overhead and amortization. Experience at this plant may determine whether the United States and Canada will take advantage of a combined potential of some 100,000,000 gallons of alcohol a year from this source.

THE ECONOMICS of alcohol production from waste sulfite liquor from paper mills has been a subject of much discussion and controversy ever since the beginning of the war alcohol program in this country. Opponents say that operating costs and plant investment are high. Proponents say that yields can be increased with consequent reduction in costs and that to overlook this source of alcohol, especially in the present emergency when we are having difficulty getting enough for war needs anyway, is to neglect an important resource.

Although alcohol from sulfite liquor is nothing new, Sweden having made it from this source for the past 30 years, the proof of the pudding as far as this country and Canada are concerned is supposed to lie in a plant built last spring at Thorold, Ontario, by the Ontario Paper Company, a subsidiary of the Chicago Tribune. Designer of the plant is a Polish engineer, M. M. Rosten, who came to Canada in 1940 after a number of years of experience with sulfite liquor alcohol in Poland. Mr. Rosten has used in the Thorold plant what is known as the "re-use of yeast" process, a method claimed to be an improvement over older sulfite liquor fermentation processes. It was first used at the Attisholz mill in Switzerland in 1936.

To understand the manufacture of alcohol from sulfite liquor and the controversy surrounding it, it is necessary to know a little about the raw material and the process itself. In converting wood to paper pulp it is necessary to cook the wood chips in an acid solution to dissolve out the lignin and release the pulp. This operation requires 8 to 10 hours in a digester. The material then removed from the digester consists of pulp in suspension in a dark brown liquid. It is this liquid, after removal of the pulp in large tanks called blow pits, that is known as waste sulfite liquor.

The sulfite liquor at the Thorold plant, according to testimony presented by Mr. Rosten before Senator Gillette's Rubber Investigating Committee on Nov. 10, 1943, contains from 10 to 13 per cent of dissolved solids, about 20 per cent of which are sugar. Of this sugar, about 65 or 70 per cent is fermentable. Thus, with the ratio of waste sulfite liquor to pulp ranging anywhere between 8 to 1 and 10 to 1, for every ton of pulp produced between 200 and 350 lbs. of fermentable sugar is made available.



According to Mr. Rosten, the sulfite liquor at Thorold comes from the blow pits of the adjoining paper mill at a temperature of from 180 to 190 deg. F. and a pH of 2.5 to 3. It contains about 3 grams per liter of free and combined sulfur dioxide. To create the best conditions for fermentation of the sugar, it is necessary to drop the acidity of the liquor to pH 6 and to remove excess sulfur dioxide and cool to 85 deg. F. The acidity is lowered by adding lime and the sulfur dioxide removed by aeration.

"Re-Use of Yeast" Method

The "re-use of yeast" method of fermentation differs from ordinary fermentation in that after the fermentation is complete, instead of discarding the yeast cellules they are separated from the wort, or fermented mass, while they are yet alive and active, thus providing full-grown yeast ready to go to work on the next batch and eliminating the necessity of growing new yeast in the batch itself. This means a saving of both time and sugar, since sugar required to feed growing yeast is lost as far as fermentation and alcohol yield is concerned. Also the need for additional nutritive salts for yeast growing is eliminated. As it is applied at the Thorold plant, the "re-use of yeast" method requires 20 hours for fermentation on the average, as against 70 to 90 hours by the Swedish method. Further savings are made by recovering the heat in the incoming sulfite liquor, a value formerly lost in the disposal of the waste liquor by the paper mill.

After fermentation, the live yeast remaining is recovered by centrifuging, and the fermented beer is pumped to the distilling equipment to recover the alcohol.

Output of the plant late last month was reported to be at the rate of 730,000 U. S. gallons of alcohol per year, with recovery of available sulfite liquor at about 70 per cent. According to plant officials, this output is expected to increase approximately 100 per cent next year.

Gillette Committee Testimony

Based on the operation of the plant at Thorold, Mr. Rosten told the Gillette Committee that between 83,000,000 and 115,000,000 gallons per year of alcohol could be produced in the United States and Canada. Quoting Mr. Rosten:

"Assuming that only 65 per cent of the sulfite liquor is recovered from the blow pits, the yield of alcohol per ton of pulp produced is about 18 gallons. With 90 per cent recovery it is about 25 gallons.

"In 1941 the United States produced about 2,900,000 tons of sulfite pulp and Canada about 1,700,000 tons. Therefore, we can get from waste sulfite liquor: at 18 gals. yield per ton, U. S. A. 52,200,000 gallons, Canada 30,600,000 gallons; at 25 gals. yield per ton, U. S. A. 72,500,000 gallons, Canada 42,500,000 gallons.

"I give below the conversion cost, based on the Thorold plant quantities and American prices, for one gallon of alcohol in a small and in a medium sized pulp mill. Overhead and amortization charges are not included. (See Table 1.)

"These figures are rather conservative. The steam consumption could be cut to 110 lbs. per gallon of alcohol. The price of steam and power is high. In a large pulp mill the conversion cost could be estimated as 8 to 10 cents per gallon of alcohol. The quality of the Thorold alcohol exceeds U. S. Army No. 1 requirements, but we can meet any requirements from point of quality having available the corresponding materials for the distilling equipment. The beer stills could be built from cast iron to save copper.

"Dr. Hall from the U. S. Department of Agriculture, Forest Service, last June made a conservative estimate of practical possibilities of alcohol production in the United States pulp mills based on 12 gallons of alcohol per ton of pulp, as against 18 gallons obtained in the Thorold plant by only 65 per cent recovery of

Table I—Projected Manufacturing Costs of 190-Proof Alcohol from Waste Sulfite Liquor for Average and Probable Minimum Size Installations

		Probable Minimum Size 1,200 gals. alcohol daily 60-80 tons pulp daily		*Average Size* 4,000 gals. alcohol daily 200-250 tons pulp daily	
	Cost per unit, cents	Units per gal. alcohol	Cost per gal. alcohol	Units per gal. alcohol	Cost per gal. alcohol
Lime, lb.	0.35	3.4	1.2	3.4	1.2
Steam, lb.	0.040	150	6.0	150	6.0
Labor, man-hr.	100	0.08	8	0.0265	2.65
Power, kwh.	0.5	1.5	0.75	1.5	0.75
Supervision, man-hr.	100	0.02	2.0	0.006	0.6
Incidentals			1.8		1.2
Total Approx. Direct Cost per Gal.			19.75		12.40

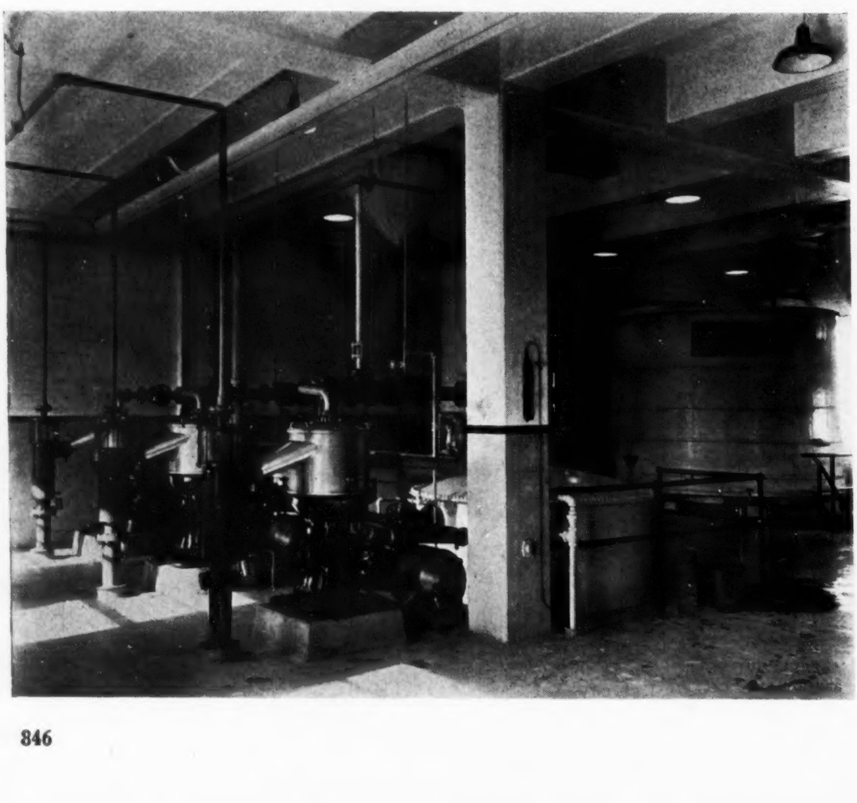
Fermenting tanks at Thorold. Output of plant this year is at rate of 730,000 gals. per year.

sulfite liquor. He stated in this report that the U. S. pulp mills of over 175 tons pulp daily capacity could operate commercially for alcohol production; but the figures above show that the small pulp mills could also produce cheap alcohol.

Table II—Pulp Mills in the United States Producing Over 100 Tons of Pulp Daily

Name	*Location*	*Tons per day*
Maine		
Great Northern Paper Co.	Millinocket	200
Hollingsworth & Whitney	Winslow	190
Oxford Paper Co.		190
Eastern Corporation	South Brewer	110
Maine Seaboard Paper Co.	Bucksport	100
New Hampshire		
Brown Paper Co.	Berlin	510
Groveton Paper Co.	Groveton	140
Pennsylvania		
Hammermill Paper Co.	Erie	215
Florida		
Rayonier	Fernandina	215
Wisconsin		
Nekoosa Edwards Paper Co.	Port Edwards	175
Marathon Paper Mills Co.	Rothschild	240
Consolidated Water Power & Paper Co.	Appleton	108
Kimberley-Clark Co.	Kimberley	100
Hoberg Paper Mills	Green Bay	106
Northern Paper Mills (a possible liquor pool)	Green Bay	110
Consolidated Water Power & Paper Co.	Wisconsin Rapids	150
Wausau Paper Mills Co.	Broka	120
Sterling Pulp & Paper Co.	Eau Claire	140
Washington		
Crown Zellerbach	Camas	475
Rayonier	Port Angeles	215
Puget Sound Pulp & Paper Co.	Bellingham	400
Rayonier	Hoquiam	225
Rayonier	Shelton	320
Soundview Pulp Co.	Everett	500
Weyershaeuser Timber Co.	Everett	200
Weyershaeuser Timber Co.	Longview	200
Columbia River Paper Mills	Vancouver	110
New York		
Dexter Sulphite Pulp & Paper Co.	Dexter	111
International Paper Co.	Palmer	160
West Va. Pulp & Paper Co.	Mechanicville	130
Virginia		
West Va. Pulp & Paper Co.	Covington	100

Centrifugals for separating yeast from the wort in the "re-use of yeast" method of fermentation as used on waste sulfite liquor at the Thorold plant.



"The total daily capacity of these pulp mills is 6,765 tons of pulp. At 18 gallons of alcohol per ton of pulp this would amount to 122,000 gallons per day, or 43,-000,000 gallons per year. Corresponding figures for 25 gallons per ton of pulp will be approximately 170,000 gallons per day, or 62,000,000 gallons per year. About 10 million gallons in addition to the figures given above could be produced by small pulp mills.

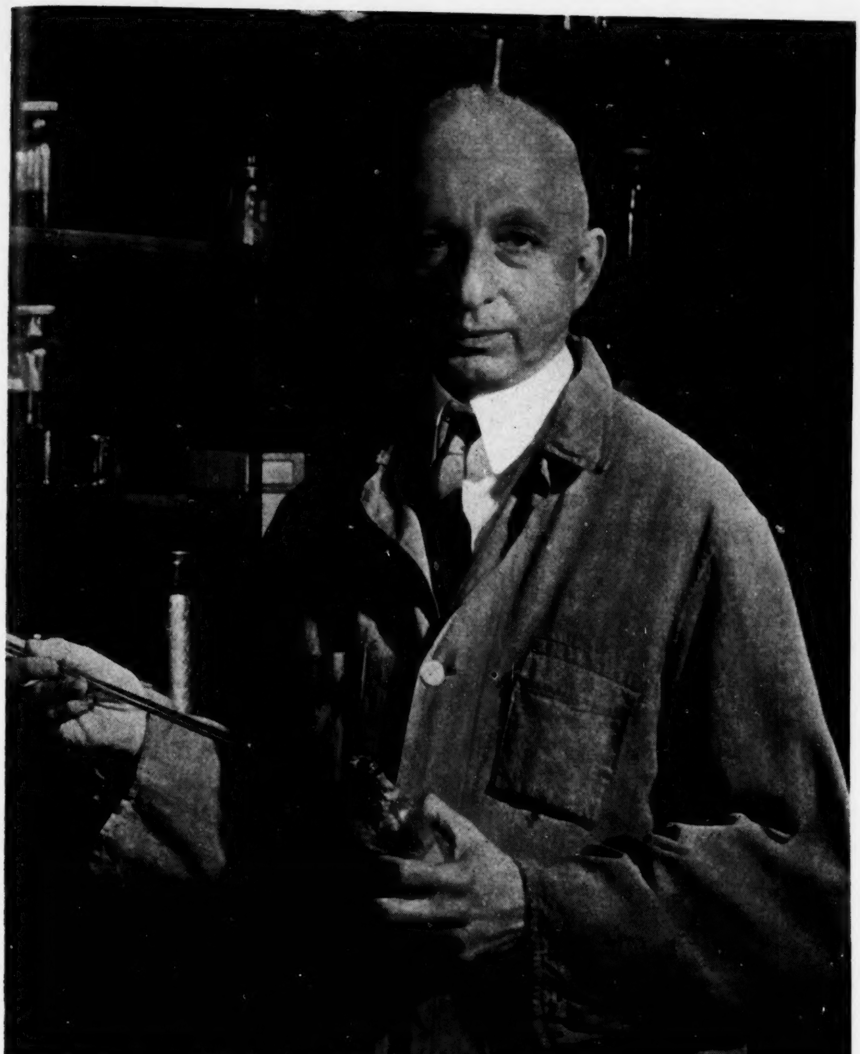
"Production of alcohol from waste sulfite liquor will not be in competition with the existing alcohol industry when one considers the new outlets now here, and those which will occur after the war, for alcohol for industrial purposes, and in view of the shortage of the conventional and traditional supply of raw materials for alcohol production.

The cheap alcohol from waste sulfite liquor in the United States and Canada could secure 120,000 to 150,000 tons of synthetic alcohol rubber per year, and its price could compete with the natural rubber successfully.

This, in brief, is the case for establishing a sulfite alcohol industry in the United States. Along with the Scholler process (fermentable sugar from wood waste by hydrolysis, a process about which more is expected to be heard soon), it has substantial backing from several sources in this country, including members of the Forest Service of the U. S. Department of Agriculture.

Thus far the chief deterrents to its adoption seem to have been lack of convincing data on costs and conflicting testimony on the amount of alcohol that would be available from such sources. Against Mr. Rosten's estimated 72,000,000 gallon annual potential in this country, government authorities say a figure of closer to 30,000,000 gallons appears to be correct on the basis of present data that can be backed up by actual experience. Also, the point is raised regarding structural materials and technical supervision for the relatively large number of small plants that would be required. On this score the Scholler process may have an advantage, since the country has more concentrated sources of wood waste than it does of paper mill waste.

Now, despite all the shouting, it is beginning to look as if the upping of demands for alcohol for the rubber program next year may finally settle the matter. If alcohol demands increase much more, and there are indications that they will, or if grains are further withdrawn as fermentation raw materials, either sulfite liquor or the Scholler process, or both, may find themselves at the receiving end of a hurry-up call for more alcohol, regardless of any remaining doubts. Qualified neutrals close to the picture say this may be sufficient to tip the scales in favor of a plant scale program in this country.



Personalities in Chemistry

MELVIN DEGROOTE

by A. D. McFayden

IN EVERY field of scientific activity there exist areas which, although they contribute greatly to the whole, are small and relatively inconspicuous. Times of emergency, like the present, bring to light the importance of some of these areas because bottlenecks anywhere along the production line can prove disastrous.

The field of demulsification, especially the demulsification of petroleum, is such a field. In the case of petroleum, it has been estimated that as much as one-third of the more than four million barrels currently produced daily in this country is emulsified as taken from the well. Before it can be refined—in fact, before it can even be made acceptable to the pipeline systems which are the common carriers of the oil-producing industry—it must be dehydrated to remove the bulk of the water present. In other words, dehydration is one of the important steps in the production and preparation of crude oil for commerce. The dehydration operation, which has now become routine, is usually either electrical or chemical in nature, with mechanical processes, heat, etc., accounting for only a small percentage of the total volume of oil being recovered from its emulsions today.

While the contributions of Dr. F. G. Cottrell to the art of electrical dehydration have been fairly well publicized, the parallel contributions of the late Williams S. Barnickel in the field of chemical dehydration, as often happens in the realm of science, have been almost completely overlooked.

It was twenty years ago that Melvin DeGroote went to St. Louis to accept a position as chemist with the Barnickel Company, now the Tretolite Company, manufacturers of chemical demulsifying agents for petroleum emulsions. Barnickel threw the torch to DeGroote, and he has held it high! Although the impetus of Barnickel's discoveries was enormous, under the guidance of DeGroote the art has been developed at Tretolite until today those earlier discoveries are substantially obsolete.

"Mel" or "The Doctor" as he is variously known to his intimates, at the present time is Vice-President of Tretolite, with responsibilities principally concerned with research and development, as well as patent matters. Much of the research done at Tretolite under his direction is codified in several hundred U. S. patents, of which more than 300 were issued to DeGroote, either as sole or joint inventor. Of these inventions he says "In almost every case, it was not a sole contribution, but a joint one, and the other parties working with me on the project contributed at least as much as I." While his associates may have assisted him, the statement appears to be a modest, generous self-deprecation, typical of DeGroote. It is certain that without "The Doctor" rubbing his thinly pelted head until the static crackles (a characteristic gesture when he is deep in the discussion of a new idea), much that has been accomplished by his group would not have been accomplished.

On the subject of that nearly polished poll, DeGroote was once teased with the observation that scientists had discovered that as a person grows older the hair grows inwardly; if it finds grey matter, it turns grey; if it doesn't, it falls out. He disposed of his baiter in typical quick-witted fashion: "I used to believe that, until one day I saw the most beautiful head of grey hair ever—on the head of a store-window dummy." The repartee illustrates his agile, well-cultivated sense of humor, which exhibits itself even during serious conferences or in trying times. He uses anecdotes constantly to illustrate points in tactical or strategic discussions. and it is difficult to upset the equanimity they characterize. Few people have ever seen him angry. An amazing gentleness and kindliness have endeared this soft-spoken man to his staff and friends.

DeGroote was born in Wheeling, West Virginia, and attended Sistersville, West Virginia, high school and Ohio State University, graduating from the latter in 1915 with the degree of bachelor of science in chemical engineering. An omniverous reader, he dashed through almost

a book a day outside of requirements in high school. At Ohio State he was an honor student, an excellent memory enabling him to keep a mass of chemical facts on the tip of his tongue. Upon leaving Ohio State he accepted a place as analytical chemist for the Maxwell Motor Company, Detroit, a firm which younger readers will know only to the extent it has been unfavorably publicized on a popular current radio program. The next year, 1916, found him working nearer home, as analytical chemist for the Koppers Company, Pittsburgh. Later that year he was advanced to research work, but an opportunity to become chief chemist of the Hachmeister-Lind Chemical Company, Pittsburgh, drew him away shortly after.

World War I found him in the Chemical Warfare Service, working at the American University Experiment Station, Washington, a physical disability precluding active uniformed service. With the close of the war, he returned to Pittsburgh to take up a fellowship at Mellon Institute on applications of glycerol, emulsions, flavors, and essential oils. This connection endured to the end of 1923, when he went west to St. Louis to cast his lot with William S. Barnickel and Company.

Physically, DeGroote is slight, but he possesses an enormous energy of body and mind that exhibits itself in a constant restlessness. George S. Kaufman once testified in answer to a question as to what he contributed to the plays he had authored: "I am the guy who paces." Laboratory results cannot come quickly enough to suit DeGroote. When a problem is being developed "the Doctor" does plenty of pacing.

Hobbies are almost precluded by the fact that DeGroote spends a very considerable portion of his time in travel; but contract bridge would probably get the nod if something had to be mentioned under this heading. Raising flowers, especially ornamental "mums," was quite a hobby for a time. Some years ago, he became interested in the breeding of tropical fish, and the solarium in his home blossomed with nearly a dozen large aquaria. Possibly Mrs. DeGroote has given this matter her personal attention—at least the tanks are no longer there.

In 1942 Ohio State bestowed on him the professional degree of chemical engineer, and he was designated as the recipient of the Sigma Alpha Mu Achievement Award in 1941. His extra-curricular activities include many years of service as trustee of the Fellowship Fund of Tau Beta Pi, which project has underwritten the expenses of graduate work for some 84 Tau Beta Pi fellows. It should also be recorded that he is a member of Phi Lambda Upsilon.

He lives with his wife and family in University City, Missouri, a St. Louis suburb. His son, Stanley, is a V-12 Navy student at Iowa State College. His daughter, Barbara, is of high school age. His relationship to his family is refreshingly tender; and, in spite of his professional activities, his home is the center of his life.

At the end of twenty years of activity in an obscure art, DeGroote continues to work with the same vigor and enthusiasm he showed when he entered it; but his productivity has been materially increased, as his associates will testify—and his technical accomplishments, represented in part by patents well known to the petroleum industry, speak for themselves.

Wide World Photo

THE PEST WITH A PRIORITY RATING

As one natural resource after another was swallowed up in the Pacific war, gaps appeared in our production economy so serious that they threatened its collapse. Even as rubber became our most strategic material, and quinine was guarded like gold, kapok, which was badly needed as stuffing in life belts and marine mattresses, went down on the chemists' lists as an immediate challenge to their ability in synthesis and substitution.

Necessity in this case led to glorification of a plant which was regarded for centuries as a farm pest, the milkweed. Like kapok, milkweed floss is hollow and has air cells to make it useful as insulation material. Like kapok, it has the softness and resilience to make it desirable for upholstering. Through it, the need of the moment was allayed, but in addition, a host of by-products have been discovered from the pods, stalks, and leaves which almost outshine the original purpose of the research. These byproducts have turned up in many diverse industries.

Manufacturers of medical supplies regard extracting chlorophyl from milkweed leaves as most significant because we depended so heavily on Germany for our supply in the past. The paper industry, hard-pressed for sources of pulp, is experimenting with the woody and bast fiber of milkweed stalks.

Interest in the fact that this bast fiber contains only slightly less alpha cellulose than cotton is keeping this plant in the experimental laboratories of the textile industries. The seed can be processed into a semi-drying oil much the same as soy-bean oil.

It is the development of these byproducts which will cut the cost of floss production sufficiently to permit its wide-scale use. The Office of Production Research and Development of WPB has entered into three research contracts with the U. S. Dept. of Agriculture, the Institute of Paper Chemistry, Appleton, Wisc., and the Brooklyn Polytechnical School to determine which byproduct developments will best accomplish this purpose.

What might have made a droll, tongue-in-check story for any farmer in his traditional scorn of the milkweed only a short time ago, has now become a serious fact—all the milkweed floss processed is being purchased by the Defense Supplies Corporation for the Government stockpile, from which allocations are made by WPB.

REFRIGERATION in the Control of Chemical Reactions

by O. E. GAMMILL, Jr. and L. E. DAY, Carrier Corporation

An interesting trend in modern chemical engineering is the use of refrigeration for the control of chemical reactions.

In the transition of a chemical engineer from freshman reactions and simple stochiometric problems to calculations for efficient industrial chemical processes he finds that rates of reaction, equilibrium, side reactions, yields, and the influence of concentration, pressure, temperature and catalysts assume great importance. Among these factors temperature is probably the most widely used controlling factor in industrial processes. And although the addition of heat to raise temperatures is the usual situation the removal of heat and lowering of temperatures is vital in many cases and is becoming increasingly useful in the control of chemical and physical processes.

An excellent example of the value of the controlled lowering of temperature is the Guggenheim process in which sodium nitrate and other salts are separately recovered from crude Chilean nitrate deposits by controlled cooling of solutions. In a recent modification of this process several improvements in the process and products were achieved through the use of more accurately controlled temperatures obtained by mechanical refrigeration.

In this modification the principal is similar but the cooling is done more gradually in steps.

The warm, saturated solution is run downward through an interchanger or cooler in which its temperature is lowered only one or two degrees. No crystallization takes place, the solution becoming supersaturated. The supersaturated solution is then run up through a screen on which are resting some seed crystals of sodium nitrate. The excess nitrate from the supersaturated solution deposits out on the seeds. The seeds are allowed to grow to a convenient size such as ⅛ inch diameter and then removed. The product is extremely pure, is easily dried, and is in excellent physical condition for shipment. The operation is repeated in other coolers and crystallizers, the temperature being lowered only a very small amount each time and the crystallization taking place only on the seeds.

In the control of chemical reactions it will be remembered that many reactions double their velocity with every ten degree rise of temperature, and by the same law, side reactions in a complex process may be made to cease or to proceed at a favorable rate by suitably lowering the temperature.

An excellent example is the decomposition of nitrogen pentoxide. It has been estimated that the times required for the decomposition for half life at various temperatures are as follows:

300°	0.000039 second
75°	51.0 seconds
25°	5.7 hours
−100°	8.4 billion years

The significance of these figures may well challenge the research worker to attempt the application of reduced temperatures to other reactions which are uncontrollable at room temperature. We have all heard of the dynamite boss at the lumber camp who in the Spring warms his dynamite in front of the fireplace so that it will work better. If heat were withdrawn from detonated dynamite fast enough to prevent its temperature from rising its decomposition reaction would be mild instead of violent.

In biological processes temperature control is necessary in order to produce the proper product. One type of cheese is made by ageing the ingredients at 50° F. An entirely different flavor would be produced if the ageing were done at 80° because at that temperature a different variety of mold would grow. The same holds true with the development of yeast in bread dough, the fermenting of beer, and the growing of mushrooms.

In the hydrogenation of cottonseed oil in the presence of nickel, cocoanut oil, and heat to produce a palatable food the temperature must be controlled. If the reaction mixture is allowed to heat up, the reaction goes out of control and the product is a hard stearine.

In the manufacture of one type of artificial rubber, styrene and butadiene are united in an exothermic reaction. If the temperature is not controlled the butadiene will polymerize to give a form of rubber not desired.

In the manufacture of another type of artificial rubber the reactants are brought together at a temperature of minus 110° F. This is done partly to control the rate of reaction but also to decrease the pressure and volume required. Certain lubricating oils are dewaxed by chilling to approximately minus 80° F. Natural gas is being stored in liquid form in spherical tanks insulated with three feet of cork at a temperature of approximately 250 degrees below zero. This enables the storage tanks to be very much smaller than the conventional gas holders.

In the past designers of chemical plants realized that certain processes would give higher yields and better products if the lowering and controlling of temperatures could be more efficiently and economically accomplished. Just as the steam engine, although an outstanding invention, had to wait for development of improved design and machine shop practice, mechanical refrigeration was for some time not sufficiently developed for applications to industrial processes. However during the past two decades many improvements have been made. Perhaps the four most outstanding ones are these:

(1) The development of the centrifugal compressor for compressing large volumes of refrigerant vapor. This is as great an advancement over the reciprocating compressors as are the ships' propellers over the paddle wheels, the centrifugal pump over the reciprocating, and the steam turbine over the reciprocating engine.

(2) The development of new refrigerants: Ammonia has done a great job and is still doing it. However, it is adapted primarily to refrigeration at the temperatures between those of ice making plant's and those of cold storage vaults. Even in this range there are many applications in which some of the newer refrigerants have proved superior. In the temperature range from 40 to 60° F. as used in air conditioning "Freon 12" for the reciprocating jobs and "Freon 11" for the centrifugals have proved to be superior both from a cost and safety angle. In the low temperature field "Freon 12" or a two stage system with "Freon 11" for the higher temperature stage and "Freon 12" in the lower, both used with centrifugal equipment, have proved to be very satisfactory.

(3) Extended heat transfer surface in many modern types of equipment has made it possible to produce smaller, lighter, and less expensive condensers, coolers, and heat interchangers. A similar improvement is the use of the new condenser tube alloys such as cupro-nickel which enable a condenser to operate for a much longer time without retubing.

(4) Finally there is the improvement in controls. No matter what the capacity of the refrigeration equipment there cannot be efficient refrigeration unless there are sensitive and accurate controlling instruments. The development of these control instuments has greatly enlarged the scope of refrigeration during the past decade.

Evaluation of Mosquito Repellents

by PHILIP GRANETT and W. RUDOLFS, New Jersey Agricultural Experiment Station; and G. C. FURNESS, National Carbon Company

CHEMICAL SPECIALTIES

UNTIL THE ADVENT OF WAR, chemical repellents for personal use were conceived primarily for the purpose of preventing discomforting bites from annoying insects. Since then improved repellents have rapidly acquired a distinct place in the methods used to protect the armed forces in regions where disease vectors, such as malarial mosquitoes, are a serious menace to health and efficiency. Along with the development of better repellents have come improved methods for the testing and evaluation of the properties which are necessary in any acceptable repellent.

IN order to transmit malaria, an Anopheles mosquito must bite at least twice. Any method aimed at reducing the number of bites which a person exposed to mosquito attack might receive will tend to reduce two possibilities, i.e., that of malaria bearers infecting the mosquitoes and that of non-malaria bearers contracting the disease. Such practices as elimination of breeding places, destruction of larvae by larvicides, draining of standing water, killing of adult mosquitoes, elimination of places where they are sheltered, and use of mosquito nets and screens have been employed to reduce the number of mosquitoes or prevent their biting. To supplement these practices various substances unpleasant or otherwise sufficiently irritating to the mosquito have been applied to the skin in an attempt to prevent their bites. Such repellents are especially valuable where the usual control measures mentioned cannot be put into operation because of such limiting factors as time, labor, materials and money.

The development of repellents appears to have been stimulated by recent wars. At any rate, shortly after the war with Spain, Oil of Citronella, although known for some time for the purpose, achieved considerable popularity as a means of repelling insects. During the first World War further interest was shown in repellents and various kinds of essential oils were investigated. In the period between the first World War and the present one, the interest in repellents continued and as a result essential oils have been replaced by synthetic organic chemicals possessing superior repellent properties. During that period the search was primarily for substances to prevent the biting of comfort destroying and annoying pests. No specific reliance was expected to be placed on repellents to prevent contraction of mosquito borne diseases.

The need for adequate protection against disease carrying mosquitoes was greatly intensified by the advent of the present war with its large troop movements in tropical areas where malaria mosquitoes and other disease-transmitting insects abound. Moreover, in those sections even if the men are supplied with ample quinine and other malarial suppressive drugs, numbers of them can be knocked out by malaria mosquitoes. Worse still, these insects can keep many continuously out of action, thus seriously reducing the fighting power of the armed forces.

In anticipation of these conditions and foreseeing the great need, the office of the Surgeon General, of both the Army and the Navy, through the National Research Council, early instigated and spurred on an intensified research program for the development of superior repellents which would meet the exacting requirements of military use.

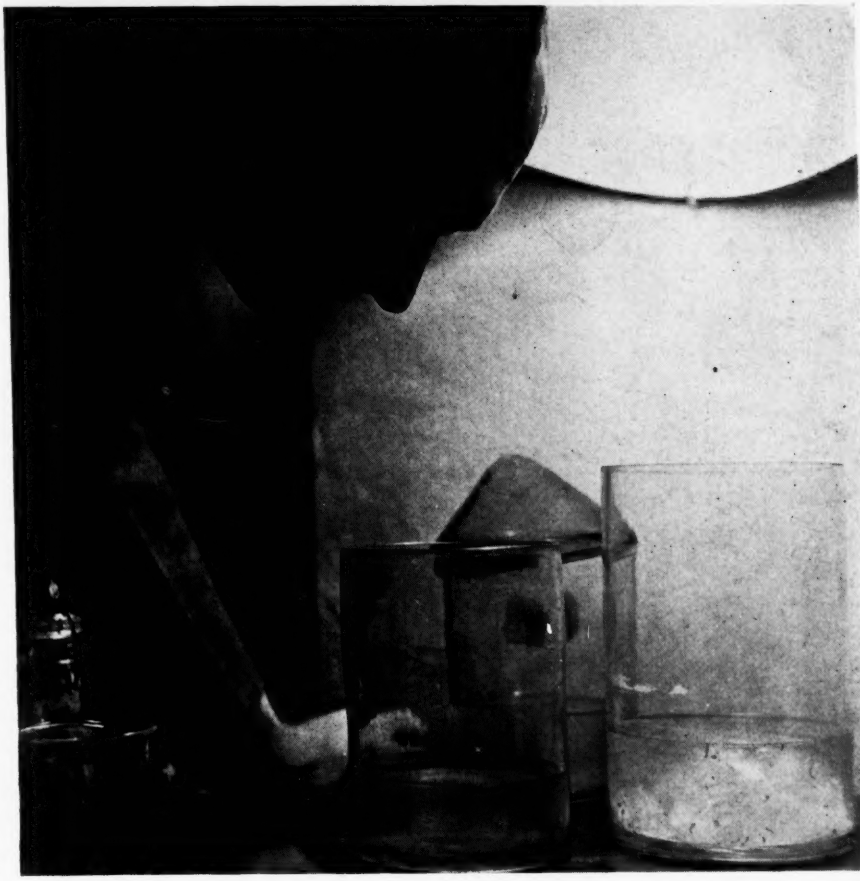
One phase of this program undertaken cooperatively at Rutgers University by the New Jersey Agricultural Experiment Station, the National Carbon Company, and the Carbide and Carbon Chemicals Corporation resulted in the development of

Anopheles quadrimaculatus, **the malaria carrying mosquito, feeding on the arm of a victim. By first feeding on persons who are ill with malaria and later biting others and injecting at the same time the organism, or plasmodium, she can transmit the disease. Note abdomen, full of blood.**

a new synthetic organic repellent which was approved for use with the U. S. fighting forces about a year ago. The nature of the compound is a "military secret" at the present time. However, the liquid is commonly known as Formula 612, this being the test number assigned to it at Rutgers.

Data indicates that if this new material were available for general civilian use it would be found to last about four to six times as long as the best pre-war repellent that had been used against the mosquitoes commonly encountered in this country. A War Department statement on "Disease Prevention Measures Effective in North Africa," states that a single application of the lotion made with this chemical repels mosquitoes for at least 400 minutes. Tests also indicate that its other properties are at least equal to and, in most cases, superior to those of any of the worthwhile commercial pre-war repellents.

Formula No. 612 is not the only effective repellent, which has been developed. There are several others which have also been approved for use by the military forces.



Mosquitoes are reared in the laboratory to obtain adult mosquitoes for repellent tests.

Properties of a Repellent

Out of the extensive research work carried on by specialists in the entomological, chemical and physiological fields in the development of these new and efficient repellents have come improved methods for the testing and evaluation of a number of properties which materials must possess to be acceptable as repellents. For discussion these properties might be considered under the following three principal attributes:

1. Prevention of biting.
2. Harmlessness to the user.
3. Miscellaneous acceptability factors.

Prevention of Biting

Ideally, a repellent should prevent bites of all types of pests for long periods of time under all kinds of conditions. Up to now we have not attained the ideal although we are closer to it than heretofore. Our first aim is to obtain substances which will repel for long periods of time. To achieve this end, selected chemicals are first tried in the laboratory against caged mosquitoes. Substances which repel for only a short time can be eliminated in this way and a good idea can be obtained of the relative merit of the longer lasting chemicals. Because different species of mosquitoes behave differently to the same substance it is necessary to try the better substances against as many different pests as can be obtained either in the laboratory or in the field. It is also necessary to have large groups of people try the better repellents because it has been found that people vary in their susceptibility to attack from mosquitoes, and protection obtained from repellents.

The desire to develop a repellent which affords the longest possible protection time conflicts with the physical properties of the chemical; volatile chemicals soon disappear and nonvolatile ones are ineffective. A compromise must be achieved by use of slowly volatile chemicals. Because the sphere of action of these slowly volatile chemicals is necessarily small, it is important to apply these repellents, either for research testing or for actual protection, thoroughly and uniformly over all portions of the body to be protected.

Not only is repellency affected by the chemical structure and physical properties of the substance under test but results may vary because of the environmental conditions under which the substance is tested. It has been found, for instance, that conditions, which cause perspiration may reduce protection time. Because a good deal of the war use of repellents is in the hot, humid climates of the tropics, resistance to the lowering of repellent effectiveness through perspiration is important.

Harmlessness to the User

Although evaluation of a repellent from the viewpoint of prevention of bites is the first consideration in the selection of a repellent substance, of equal importance from the viewpoint of eventual application is its harmlessness to the user. Repellents may need to be applied several times a day, for many days at a time. No harmful or irritating effects on the surface of the skin and no harmful internal effects as a result of absorption through the skin can be permitted.

Tests to determine physiological safety must be made by men who are trained in that field. For determining the effect of a product on the skin, the tests are relatively quick and simple, involving application of the chemical to human and animal skin and observing for signs of any irritation, reddening, drying, staining and skin sensitization under single and long continued applications.

Tests to determine whether or not the chemical is absorbed and, if so, whether the absorbed chemical is harmful internally, are much more difficult to make, are time consuming and require considerable knowledge for interpretation of results. Such tests involve, in part, determination of oral toxicity in animals, in varying doses over short and long periods, and direct daily application to the skin of animals over long periods of time. It is understandable that before a repellent can be judged satisfactory for use for military

The initial evaluation of repellents is made in the laboratory by applying measured quantities of the material to be tested to the arms and then exposing these treated areas to the attack of caged mosquitoes.

The repellents which are found highly effective in the laboratory are tried in the field. This tester is counting the number of bites received in one minute on untreated arm and leg to determine mosquito activity in the test locality. In testing it is necessary to have a number of people try the better repellents because it has been found that people vary in their susceptibility to attack.

or civilian purposes, a substantial margin of safety must be required.

Miscellaneous Acceptability Factors

Although prevention of biting and safety to the user are undoubtedly the chief factors which must be considered in the search for satisfactory repellents, there are a number of other factors which are of sufficient importance that they may disqualify an otherwise acceptable material. Such factors are odor, availability, cost, stability, and harmlessness on contact with various surfaces.

Odor—Even though odor may have no direct bearing on its effectiveness, if it is to be used for any length of time, a repellent must be non-odorous or have an odor which is not disagreeable. A repellent having an unpleasant odor, even though highly effective will be used sparingly or not at all. If necessary, mild odors can often be improved or neutralized by the use of small quantities of suitable chemicals.

Availability—From the viewpoint of the large scale needs of the armed forces, availability in quantity is an important factor which may tip the balance in favor of a less effective but more easily procurable chemical. In the case of a highly effective chemical which cannot be manufactured readily in large quantities or which requires intermediates or equipment needed for other war products, consideration must be given to alternates, different methods of manufacture, possibilities of allied chemicals or other substitutes.

Stability—Because of the extrêmes of use and storage conditions likely to be encountered, it is necessary for a product such as a mosquito repellent to be stable. The investigator should know whether the product will deteriorate or change in form or effectiveness on exposure to light, varying temperatures from below freezing to 125° F., necessary packaging and handling methods, and exposure to atmospheric moisture.

Harmlessness in Contact with Various Surfaces—Although care can be exercised in handling repellents, it is preferable to use one which is relatively inert to surfaces with which it may come in contact. Such surfaces may include all types of fabrics, leather goods, paints, varnishes, lacquers and plastics. It is necessary to know whether a repellent has any adverse solvent, penetrating, softening, weakening, or staining action.

Acknowledgment

Based on Journal Series Paper of the New Jersey Agricultural Experiment Station, Rutgers University, Department of Entomology. The work reported is an outcome of a Research Fellowship sponsored there by the National Carbon Company since 1935.

BELT DRESSINGS Offer Opportunity in Specialty Field

by CHARLES F. MASON, Consulting Chemist

CHEMICAL SPECIALTIES

BELT DRESSINGS have in general not kept up with progress in belting materials and manufacture, and an opportunity exists for chemical research. The author here comments on some of the formulas given in the literature.

EVER SINCE the first time our ancestors laced strips of raw skins or poorly tanned leather into loops and stretched them over pulleys for power transmission, there has been a search for tacky substances to aid adherence of belts to rotating surfaces.

It is likely that exudates from the trunks of trees in tropical and semitropical zones were the earliest belt dressings and were used up until the introduction of resin and turpentine. In recent years there has been marked progress in the manufacture of belts, and today we have them made from leather, canvas, rubber in its various forms, and combinations of canvas and rubber, but corresponding progress unfortunately has not been made in belt dressings. There are still too many cases where incorrect or even harmful dressings are being made and sold to unsuspecting customers. This is largely because the bulk of production and sales of these compounds is in the hands of lubrication distributors, small specialty producers, and dealers in belting, all of whom consider them only as a side line. Virtually no real research has been done in the field of belt dressings, with the result that we find multitudinous combinations processed into finished products with little consideration for injury to the belt or behavior on different types of belts and under different operating conditions.

Recent investigations have disclosed that rosin and its modifications have an injurious effect upon leather and rubber, but it is still used widely, largely because it is cheap, provides good tack, and is easy to use. It is simple to plasticise rosin with an oil by heat or an additional solvent. If this combination does not meet the correct physical requirements of hardness and melting point range, a wax is incorporated and the product is sold in stick form. However, a belt of any material needs an oil for softening to make it pliable, and only then, after it is in a condition so that it fits snugly to the pulley, will a tacky substance properly provide traction. So treated, a belt will last much longer and there will be less strain on the pulley bearings than if traction is obtained by tightening alone.

In the light of this, one would consider a belt dressing of the liquid type to be superior to one of the stick type, but the latter are more popular with mechanical men in general. It is true that the solid ones contain oil, but it is "set up" with rosin and little can penetrate into the belt to impart pliability. Waxes do not penetrate because the temperature at which the dressing is applied is usually below the melting point of the wax; also, they lessen traction.

Since the turn of the century, the patents granted on belt dressings have been about equally divided between the two types, and the formulas submitted in subsequent paragraphs are arranged in chronological order to illustrate the trend of the past four decades.

The advances made in tacky compounds used on adhesive, electrical, paper and cellophane tape should be an inspiration to belt dressing producers and stimulate a movement for compounding milled rubber into their products. Also, in 1930 a method was published for treating belts to eliminate static, although to date few have taken advantage of the process.

The following belt dressing formulas are from patents and the literature, and are not necessarily recommended; some, in fact, are distinctly not recommended, as will be noted in the comments accompanying them. In any case, they should be used only as starting points from which to produce a product to fit a specific need.

1.	Cylinder oil	65
	Fish oil	12
	Neatsfoot oil	11
	Rosin	6
	Pine tar	3
	Prussian blue	1
	Essential oil	2

The rosin and pine tar are mixed into a portion of one of the oils and the mixture is heated until solution has taken place. After cooling, the balance of the oils are added and with them the pigment, prussian blue, which can be broken up with an oil by hand to aid in dispersion. This is a typical liquid dressing.

2.	Rosin	46
	Paraffin	2
	Turpentine	27
	Brazilcopal	2
	Benzine	22
	Nitrobenzene	1

The rosin, paraffin and Brazil gum are melted in one container and after removal from the source of heat the turpentine and then the benzine are stirred in. After cooling, the nitrobenzene is mixed into what is a viscous product. Although this is one of the accepted formulas, the absence of a non-volatile oil and the presence of inflammable liquids, which will finally evaporate, render it far from ideal.

3.	Turpentine	50
	Black oil	20
	Glycerine	20
	Sesame oil	6
	Color	2
	Perfume oil	2

The black oil comprises a mixture of cottonseed oil, lubricating oil, and sesame oil in equal amounts, to which 2 per cent of vaseline has been dissolved. The black oil is heated to 50 deg. C. and the turpentine to the same temperature in another container. After mixing, the other components are stirred in, resulting in a liquid with no tacky substances present and useful only for keeping a belt pliable. The turpentine will eventually evaporate resulting in a fire hazard. The three oils present in the black oil are hardly necessary; any one would be sufficient.

4.	Pine oleo-resin	15
	Codliver oil	30
	Petroleum oil (spindle)	53
	Nitrobenzene	2

The oleo resin is added to a portion of one of the oils and the mixture is heated until solution is complete. The other oils are then added and heating continued until a homogeneous liquid is obtained. After cooling, the nitro-benzene is added for imparting an odor. This approximates the liquid dressings sold today with the exception that less expensive vegetable oils like soybean are equally satisfactory, and nitrobenzene being poisonous should be replaced with one of the less expensive essential oils.

5.	Molasses	80
	Paraffin	5
	Rosin	5
	Beef tallow	10

It is obvious that paraffin, rosin and beef tallow are immiscible with molasses,

which is essentially a viscous solution of sugars and decomposition products from the sap of sugar cane or sugar beets. The method of production is to melt the three latter components in one container and the molasses to the same temperature in another. One is then poured into the other with stirring and upon cooling any separated particles may be held in the interior of the product by the viscous medium. This is one example of a combination of materials chosen with no knowledge of their behavior.

6. Rosin	61
Beeswax	8
Linseed oil (raw)	7
Beef tallow	7
Dye (aniline)	1
Pumice	16

This is a typical stick dressing, which can be poured into paper tubes and must be agitated during the pouring to prevent the settling of the pumice, which might be present in different amounts in different tubes. It is made by simple melting and stirring in the pumice. The absence of an oil, which can soak into the belt to keep it pliable, is compensated for by the presence of wax and fat which may to a degree serve the same purpose.

7. Linseed oil (boiled)	43
Gasoline	43
Calcium carbonate	6
Oil drier	8

This is made by simple mixing and is only for softening the belt. The absence of tacky substances may be compensated later by the formation of resins by the oxidation of the drying oil in the presence of a drier. It is made by simple mixing in the cold and the presence of gasoline makes it a fire hazard.

8. Lubricating oil	75
Rosin	22
Beeswax	3

The rosin and beeswax are melted in a container and the oil added to it. The heating is continued until a homogeneous solution is obtained and upon cooling a viscous mixture is obtained. This approximates the ideal if the hardness is such that an excess is not applied upon one application, resulting in an accumulation upon the pulley and consequent loss of traction.

9. Lubricating oil	76
Castor oil	5
Lard	2
Rosin	17

This is made by heating, and the resulting product will be one of the liquid variety with tack and lubricating qualities. The presence of the lard is hardly necessary as it can be replaced by more castor oil.

10. Gum arabic solution in water (10%)	18
Castor oil	68
Fish oil	14

This is for fabric belts and is made by mixing of the oils into the viscous solution of gum arabic in water. The water must be heated and the gum added in small amounts with stirring. It is purely a lubricant or softener with very little tack, which is supplied by the gum. It is ideal for belts.

11. Gum arabic solution in water (10%)	10
Castor oil	22
Fish oil	8
Neatsfoot oil	60

This is made by simple mixing as above and is recommended for leather belts. It softens and has no material detrimental to leather.

Heavy duty belts, such as those on this giant forming press, require proper dressings to prevent slipping, cracking and excessive wear.

12. Lubricating oil (100 to 200 Saybolt)	70
Sulfonated mineral oil (oil soluble)	20
Neatsfoot oil	10

This is made by simple mixing and is for lubrication and softening. The sulfonated oil is the sodium salt of sulfonated mineral oil sludge after extraction with alcohol.

13. Vulcanized rubber in the form of inner tubes and used gloves is heated to about 400 to 500 deg. F., and upon cooling the viscous mass is mixed with an essential oil for perfuming purposes.

14. Leather (ground 30-50 mesh)	18
Rubber latex 75% rubber	52
Ammonia (0.880)	6
Water	18
Latex 25% rubber	4
Casein (soluble)	2

A hard grade of sole leather is grated and sifted. The casein is mixed into the water, the ammonia is added and after the two grades of latex are worked in the powdered leather is stirred in with the aid of a mechanical mixer. This can be applied by brush or knife and is recommended for old belts. They should dry for 3 to 4 days before reuse.

15. Rubber solution,	83
Dextrose	15
Styrax (sweet gum)	2

The rubber solution is made by melting 80 lbs. of smoked crepe or one of the less expensive rubbers from South America like Pontianac, balata or Gutta Jelutong and while hot adding 20 lbs. of Pine-Sol Venice turpentine or turpentine. This should be a very tacky dressing and contains the least of the harmful resins.

16. Montan wax	7
Wool fat	23
Sulfite sludge	70

This is made by a heating operation and is typical of combinations used abroad, where montan wax and wool fat are plentiful. However in time of war it is out of the question as neither of these materials are being imported.

17. Rosin	65
Tallow	6
Stearic acid	1
Scale wax	20
Castor oil	2
Rosin oil	1.8
Lanolin	4.2

This is a stick dressing and is typical of the formulas found in the formula books now being published. It involves a simple heating operation, and for stearic acid, rosin oil and lanolin oil, castor oil can be substituted.

Progress Made on Separation of Protein and Enzyme from Wheat

FURTHER WORK BY THE Bureau of Agricultural and Industrial Chemistry on the Balls-Tucker process for sulfite extraction of protein and diastase from wheat shows that yield of protein is determined chiefly by kind of wheat, concentration of sulfite, type of stirring, and presence of air.

In its July, 1943, issue, CHEMICAL INDUSTRIES *reported on a new process for making industrial alcohol from wheat which was developed by Dr. A. K. Balls and Irwin W. Tucker of the Enzyme Research Laboratory of the Bureau of Agricultural and Industrial Chemistry of the U. S. Department of Agriculture. This process eliminates about 75 per cent of the malt ordinarily required in grain fermentation processes by supplying diastase from the wheat itself through extraction of the wheat with an 0.05 to 0.15 per cent solution of sodium sulfite. At the same time a relatively pure form of protein is separated from the wheat. The following is digested from an interim report of further work that has been done by the Enzyme Research Laboratory at Albany, California, on the sulfite extraction step of the process.*—EDITORS.

IT HAS PREVIOUSLY been demonstrated that when wheat meal or wheat flour is stirred vigorously with warm dilute sulfite solutions, a large quantity of "diastase" is set free from the flour, and dissolves in the liquid, where it is active. Furthermore, much of the wheat protein forms a scum containing relatively little starch. When, therefore, the system is allowed to stand after stirring, it settles into three layers: a scum of protein, a middle layer of nearly clear fluid, containing wheat diastase and some other proteins in solution, and a sediment containing starch and the remaining protein.

The diastatic liquid has been used to replace about four-fifths of the malt ordinarily used for conversion of the starch to fermentable sugar after cooking. In several alcohol plants where this has been tried the yields of alcohol have remained about the same as with the full amount of malt.

The protein recovered as a scum has been successfully washed with water to remove starch remaining in it. Thereafter it has been denatured by heat and subsequently dried. It has not yet been possible to determine the yield of protein obtained in this way on a large scale, but in laboratory experiments the yields have varied from twenty per cent of the total protein of the flour up to seventy per cent. Yields of fifty per cent have been obtained consistently.

In general, wheat flour or wheat meal has been extracted at approximately 40 deg. C. with 5 times its weight of a sodium sulfite solution varying in concentration from 0.05 to 0.15 per cent. Vigorous stirring is necessary for the formation of the protein scum, and in the laboratory concurrent aeration has been found advisable.

Factors Affecting Protein Yield

Several factors determine the yield of protein recovered from flour by the sulfite method. Four of these are: Type of stirring, kind of wheat, concentration of sulfite, and presence of air. Although the study is not finished, some deductions as to the effects of these factors may be made:

1. An increase in the temperature of the sulfite solution from 42 deg. C. to 50 deg. made very little difference in the protein recovery, but destroyed the amylase in solution.
2. A concentration of 0.05 to 0.10 per cent of the extracting medium originally suggested still appears to be the best, but this may well be found eventually to vary with the flour. With no sulfite, no measurable amount of protein was recovered.
3. The yield from soft wheat tends to be lower than that from hard wheat, but it is affected for the better to a greater degree by stirring, air and fineness.
4. The affects of stirring, air and time of extraction appear to be interrelated. More rapid stirring as it was done in the present experiments always incorporated more air. Increasing the aeration and agitation led to great improvements in the yield of protein and shortened the time required to separate it. Hard granular flour gave about 5 per cent higher yield when treated vigorously. Patent flour gave still greater increases, inasmuch as no protein was recovered by a mild treatment while a good yield (55.5 per cent) was obtained with more vigorous aeration and stirring. Under the more vigorous conditions, the highest yields obtained were with patent flour.

The protein not recovered as scum was found largely, but not entirely, with the starch fraction. The experiments indicated that when about 40 per cent of the protein was recovered as scum from a medium hard granular flour (Davenport) an equal amount was found in the starch, and the remaining 20 per cent was dissolved in the sulfite liquor.

The purity of the proteinous material recovered depends on the thoroughness with which the starch has been washed out of the scum. The scum from fine flour contains more starch than from granular flour and therefore requires more washing. When this was carefully done in the laboratory a product was obtained in which about 10 per cent of the starch remained.

Nature of Diastase in Flour

Assuming that "diastase" consists of only two enzymes, namely alpha-and beta-amylase, a procedure was developed for estimating the quantity of each, and it was found that the amylase extracted by sulfite contains very little alpha-amylase. It was found that barley malt contained roughly 200 times as much alpha-amylase as did wheat flour. A preparation of mold bran contained three times as much alpha-amylase as barley malt, and an old sample of pancreatin contained 16 times as much.

An amount of malt equivalent to two per cent of the wheat flour has been found in practice to accelerate the conversion of starch by wheat diastase markedly and sufficiently.

A determination was made of the amylase content of the sulfite extracts from a number of grains and varieties of wheat, including rye, Kaffir corn, wheat bran, wheat chaff, granular wheat flour, whole wheat meal, and patent flour. Measured by Lintner values, amylase ranged from almost zero in the extracts from Kaffir corn and wheat chaff, to 140 Lintner units in those from granular wheat flour. The wheat bran extracts ranked next highest.

It was found that the proportion of flour to extractant may vary within wide limits without appreciable loss of diastase in the extract. However, less extract can be conveniently removed from the sediment as the proportion of flour to extractant is increased. On the other hand, because of the greater protein content of the more concentrated extracts, the enzyme therein is more stable.

The complete report, which contains a number of charts and tables, is available from the Enzyme Research Laboratory, U. S. Department of Agriculture, Albany, California.

Three of the new officers are John Powell, treasurer; Henry A. Nelson, president; and N. J. Gothard, vice-president.

NAIDM Reviews Problems at 30th Annual Convention

MANPOWER, materials and post-war plans held the spotlight at the 30th Annual meeting of the National Association of Insecticide and Disinfectant Manufacturers' Association on December 6 and 7 at the Hotel New Yorker in New York City.

The two-day meeting was devoted largely to technical reports and symposia in which it was possible to glimpse a trend toward definitely improved products through an increased emphasis in the industry on research and application of new synthetics and chemically modified natural materials. As John N. Curlett, retiring president said in his address: "The basic raw materials on which the insecticide and disinfectant industry were established have been commandeered for the duration but true to the esprit de corps of this group, as well as the American people, substitutes have been produced and developed which are filling the war gap. The future of these substitute products rests in the hands of their creators through continued development and research in the post-war period."

After the president's address and the secretary's report the Monday morning session was devoted largely to a discussion on post-war problems. Melvin Fuld of Fuld Brothers led off with "Post-war Preparation," in which he analyzed the following five basic factors: 1. Products, 2. Production, 3. Sales, 4. Personnel and Labor, 5. Finance.

In discussing products, he said: "We know that there must be tremendous quantities of synthetic chemicals which have insecticidal and disinfectant properties, and we must ask ourselves:

Will the substitute pyrethrum insecticide concentrates have a place in insecticide controls?

Will Aresol type sprays replace our sprays of today?

Will a fumigation type spray be the coming type of roach control?

Will we be able to eradicate mosquitoes through a grub control?

Will substitute phenols replace cresylic acid?

Will odorless disinfectants replace coal tar, pine oil and cresylic acid?

Will high-powered disinfectants of the quaternary ammonium type make an inroad into dairy, dishwashing and eating sanitation?

These and hundreds of other hypothetical questions should be running through the minds of our technical staffs."

Following Mr. Fuld, L. N. Markwood of the Bureau of Foreign and Domestic Commerce spoke on "Post-War Markets." He said that on the basis of projected national income in 1946, the probable first postwar year, sales of household disinfectants and repellents should amount to about $41,000,000, as against $29,000,000 in 1939. Mr. Markwood called upon manufacturers to cultivate foreign markets as an outlet for a larger proportion of their production after the war. Whereas exports accounted for roughly seven per cent of domestic manufactures of household insecticides in 1939, he urged that 10 to 15 per cent be set as the postwar goal, a figure which should be easily attainable since American troops will have established the value of insecticides among natives of many countries that had never used them before. In 1939 South American Countries took 44 per cent of all U. S. exports of insecticides and the British Commonwealth took 30 per cent.

Containers

In the symposium on containers led by J. L. Brenn of Huntington Laboratories, Inc., it was stated by Mr. Zuck of the Inland Steel Container Company that WPB is going to try to allow sufficient steel to provide containers for all liquid insecticides. He urged those submitting priority applications for steel containers to be sure to give all the information requested. In answer to a question from the floor, Mr. Zuck said that rumors to the effect that there is now an overproduction of steel plate are unfounded. The situation is slightly easier, but the supply is still far from sufficient for all uses, he said.

Martin Vogel of Standard Containers, Inc., reported on the non-critical hand sprayer developed by his company. Six million of these have been made so far and it is anticipated that there will be ample to take care of the demand for this coming year.

John A. Rodda, chief of the insecticide and fungicide unit of WPB said that enough tin plate and steel has been released to make 2,500,000 hand sprayers of less than one quart size for household use exclusively during the first quarter of 1944.

With regard to glass containers, it was reported that demand is expected to exceed supply by about 27,000,000 containers in 1944. Paper for packing, however, is expected to be as much or more a limiting factor than the glass itself.

Insecticide Raw Materials

Reporting on the insecticide raw materials outlook for 1944, Mr. Rodda looked for no easing of the pyrethrum situation and stated that while there will be some offgrade material for agricultural and essential civilian uses, most of it will continue to go to the military. Enlarging on this viewpoint, H. R. King of R. J. Prentiss & Company said that the army will need all of the pyrethrum it can get and will get all but 10 per cent coming into the country in 1944. This 10 per cent will be made up of refuse from Kenya flowers and low grade Brazilian flowers. Pyrethrum is being used in the army and navy solely for the control of malaria mosquitos, he said, and none of it is being used in the United States proper. He estimated that the 1944 crop of pyrethrum from Kenya Colony, the Belgian Congo and Brazil, will amount to about 7,650 metric tons, of which Great Britain will get 60 per cent and the United States 40 per cent. He also said that 10,000 pounds of Kenya pyrethrum seed are to be planted in Central and South America.

On rotenone, Mr. Rodda said he did not share the optimism of some in the

industry with regard to 1944 supply. He foresaw a tighter rather than an easier situation. Mr. King, however, predicted that 2,000,000 pounds of 5 per cent material will be available for agricultural and victory garden use.

Copper compounds were reported as adequate for agricultural and essential civilian needs. Arsenicals are easing considerably and WPB believes that it will be able to supply material for all projects submitted. Methyl bromide is now coming under allocation.

Most of the synthetics appear to be in adequate supply. D. F. Murphy of Rohm & Haas Company reported that Lethane production will be stepped up about 40 per cent in 1944. He also stated that two new products, Lethane A-70 and Lethane B-71 are about to be introduced, the first a concentrate designed for making powders for roaches, ants, and similar insects, and the second a powder concentrate for use in making dusting powders for agricultural use on such crops as peas and beans.

As far as insecticide base oils are concerned, C. R. Cleveland of the Standard Oil Company (Indiana) said that demand in the middle west has increased 100 per cent over normal peacetime use and that facilities are strained to capacity at present. Eric Meyer of L. Sonneborn Sons, Inc., said that the situation in the east is not as bad and that he anticipates supplies will be ample to handle requirements during the coming year.

Disinfectants

At the Tuesday morning Symposium on Disinfectants the discussion was led by E. G. Thompson of the J. R. Watkins Company.

The first member of the panel was M. B. Turner of the Dow Chemical Company who reported that production of "Dowicides" has been increased considerably and laboratory investigations are being carried out to extend the applications of these materials.

Dr. Arthur Cady of Givaudan-Delawanna, Inc., discussed the composition and application of various substituted phenols.

Frank U. Rapp of Hercules Powder Company reported that pine oil producers, instead of producing an expected 60 million lbs. of pine oil in 1943, will be hard pressed to release more than 43 million lbs. Summarizing the situation he said, "Production is off 17 million lbs. per year; new markets have been created to the extent of 6 to 8 million lbs.; and several established markets have increased their consumption anothed 8 million lbs. The outlook is that pine oil will not remain a freely available commodity during 1944 unless hostilities cease next year."

John D. Fleming of Monsanto briefly discussed Santophens and the impact of Army and Navy specifications on the whole subject of germicides. He stated that the company expects to be able to take orders for benzolated phenols early in 1944.

P. G. Bartlett of Rohm & Haas discussed Quarternary Ammonium disinfectants which had been developed and used originally as wetting agents and are now being recognized for their bacteriacidal properties.

B. G. Philbrick of Skinner & Sherman, Inc., discussed the phenol coefficient as a basis for the evaluation of unknown disinfectants. He also discussed the Peet-Grady method and the need for improved culture mediums.

E. G. Klarmann of Lehn & Fink Products Corp. discussed the effect of organic matter upon the germicidal performance of certain disinfectants.

Following this symposium L. A. Schlueter, Coal Tar Products Unit, WPB, reviewed the tar acid supply and distribution situation. John B. Glenn outlined a bright future for business with countries to the south in his talk entitled "Post-War Opportunities for Trade in Latin America." Captain Gilbert A. Dunnahoo, Assistant Surgeon General, related a few of his experiences of his recent trip to various battle fronts and told of the precautions being taken to control disease among the fighting forces. He also described some of the measures being adopted to prevent infestation of this country by carrying insects back from foreign countries on ships and airplanes.

At the afternoon session Dr. H. A. Shelanski of Symth Laboratories reviewed progress in animal taxicity tests and Sterling W. Mudge, District Director, State of New York, War Manpower Commission, gave a detailed report on the methods and usefulness of the Training Within Industry program.

Floor Waxes and Polishes

The last group discussion was a symposium on Floor Waxes and Polishes, led by G. A. Bowden of American Home Products Corp. who discussed the need for dependable sources of supply of waxes and other materials entering into improved polishes.

E. G. DeLaney, Stroock & Wittenberg Corp., reported on the development of formulations in which scarcer gums, resins and waxes could be replaced by Congo gum.

Melvin Fuld described a new and satisfactory method for testing the relative degree of slip of floor waxes, and outlined the usefulness of a new pendulum type testing machine developed by Percy A. Sigler.

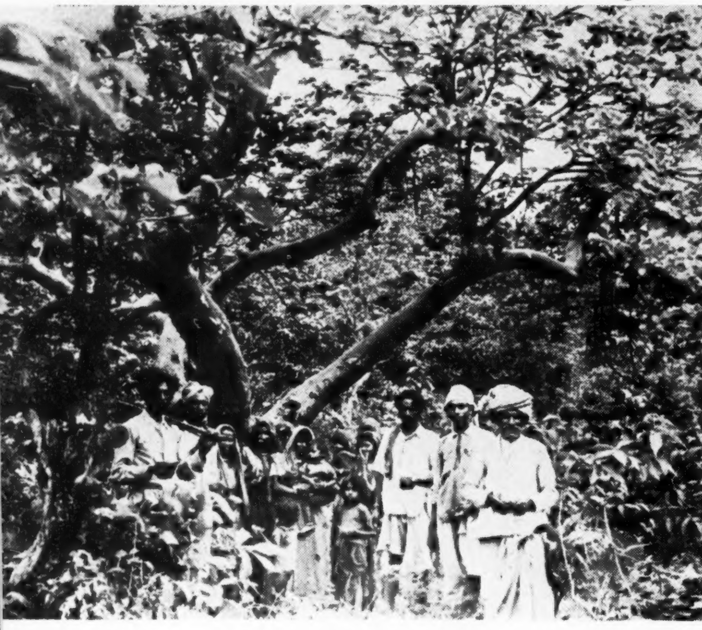
R. B. Trusler of the Davies-Young Soap Company was the last speaker in this symposium and discussed the use of safe oils for wooden floors to render them less burnable, and also improve other characteristics.

New Officers

Following this last symposium the following officers were elected for the coming year: President, Henry A. Nelson of the Chemical Supply Co.; 1st Vice-President, N. J. Gothard of the Sinclair Refining Co.; 2nd Vice-President, Gordon M. Baird, Baird & McGuire, Holbrook, Mass.; Treasurer, John Powell, John Powell Co.; Secretary, H. W. Hamilton, White Tar Div., Koppers Co.

The following members were elected to the Board of Governors: J. L. Brenn of Huntington Laboratories, John Curlett, of McCormick & Company; A. W. Morrison of Socony-Vacuum Company, and J. A. Marcuse of West Disinfectant Company.

Below, left to right: John N. Curlett, retiring president; John A. Rodda, chief, Insecticide and Fungicide Unit, WPB, who spoke on "Supplies of Raw Materials;" L. A. Appley, Executive Director, War Manpower Commission and vice-president of Vick Chemical Co., who addressed the meeting on "Allocating Manpower;" and Melvin Fuld of Fuld Bros., who discussed, "Postwar Preparation." **For other pictures, see page 863.**



Karaya trees in the Indian forest

Water Dispersible and Bulking Gums--2

GUM KARAYA

by CHARLES F. MASON, Consultant Chemist

THIS IS THE SECOND in a series of articles on available water dispersible and bulking gums that might be used as substitutes for similar but less plentiful materials. The third article, to appear next month, will be on locust bean gum.

GUM KARAYA comes from a species of trees common to southern Asia, particularly India, where natives gather it from incisions made in the bark of the trees and sell it to the government for export. Often termed "India gum," karaya is not to be confused with Indian gum, which is gum ghatti and will be described in a subsequent article in this series. In India, the natives and some traders refer to it as Gum Kadaya, Katila and Kulloo, but these names are seldom heard in the United States.

In the past two decades imports of gum karaya into this country have averaged 2,500 tons a year at prices varying from 9 to 11 cents per lb. There is no doubt that large quantities are available and only await a wider field of application.

Prior to 1917 gum karaya received no attention from scientists in America judging from the literature, and for a decade after the World War attention was principally to methods of identification, estimation of chemical properties, and use as a thickener in plant sprays. In the latter case the toxic effect of nicotine sulfate when dispersed in water with the aid of soaps was increased by the addition of karaya gum in the amount of 0.2 per cent.

However, since 1927 there has been more activity from a physico-chemical point of view, and the viscosity of the water dispersions, methods of making them, degree of acidity and the colloidal properties have been investigated.

Table I—Properties of Gum Karaya

Source	*Stercula Urens (Karaya) India*	*Stercula Urceolata (Karaya) India*	*Acacia Decurrens (Arabic)*
Moisture, %	11.60–15.31	11.00	12.00
Ash, %	6.07–6.96	11.80	2.30
Volatile acid Acid No. as acetic	13.40–21.30	......	......
Acid No. direct, water as solvent	25.24	......	......
Acid No. direct, alcohol as solvent	16.88	......	......
Fehling's soln.	......	Reduction	Positive
Peroxidase	......	Negative	Positive
Under microscope	Threads, feathers	......	......
Behavior in alcohol	Swells in 60% soln.	......	......
Behavior with iodine	No change	No change	......
Volatile base	0.42% as ammonia	......	......

It will be noted from Table I that the moisture content of gum karaya varies from eleven to fifteen per cent, and it is very likely that if these gums were dehydrated they would become insoluble as in the case of gelatin. They have no definite melting points. Karaya chars between 198 and 200 deg. C.

Investigators have reported that an odor of acetic acid and of trimethylamine have been noticed from finely ground karaya gum. Another reported that after hydrolyzing the gum in dilute hydrochloric acid and then boiling the dispersion with dilute sodium hydroxide an odor of benzaldehyde was observed.

The data of S. G. E. Stevens listed below show the variation in pH of seven samples of gum karaya. In each case five grams of gum were dispersed in 200 milliliters of water without heating and the pH obtained by colorimetric titration.

Sample Number	
1.	4.00
2.	3.60
3.	4.40
4.	3.70
5.	3.70
6.	3.80

It is apparent that the gum gives an acid reaction in water. This led some people to try the effects of alkalies upon the gum, and in the year 1920 a patent was granted in Great Britain upon the claim that alkalies rendered this gum soluble. One claim was that after dispersing it in water at such a concentration that the viscosity was not an impediment, a non-oxidizing base such as sodium bicarbonate was added and upon evaporation of the water a soluble product was obtained which was useful in making water paints and calcimine. As in all patents, many claims were made, including ease of introduction of casein by various methods and the solubilizing effect of alkaline peroxides, persulfates and percarbonates. This process may be in use today, but the competition of other adhesives and the advantage in price of glue and starch combinations is to be considered.

The above claims appear exorbitant, and it is very likely that instead of a soluble product, one was obtained which contained fewer lumps and flowed more freely than one without the alkali. In this respect some rough observations upon the

relation of degree of fineness to properties of the dispersion in water are listed below to emphasize that mesh size is important in using powdered gum karaya, especially where dispersions are to be made without the aid of heat.

Per Cent of gum in the water dispersion	*Screen size of powdered gum*	*Properties of the dispersion*
2%	200 mesh	Coherent mass, flows easily
4%	200 mesh	Thick and viscous, adheres to glass
2%	100 mesh	Separates in clumps
4%	20–30 mesh	Full of air bubbles, slides freely and has free water
4%	5–20 mesh	Free water visible that can be drained off.

Viscosities of water dispersions of gum karaya are given in Table II and plotted in Figure 1. The curve for gum arabic is also indicated in Figure 1 for comparison and to aid in deciding whether to use karaya for thickening or the more expensive arabic.

Table II—Viscosities of Gum Karaya Dispersions in Water at 25 Deg. C.

Gm. of gum in 100 gm. of water	*Apparent Relative Viscosity of Three Separate Samples* No. 19	No. 30	No. 14
0.20	3.70	4.53	3.39
0.30	5.25	7.23	4.87
0.40	8.75	14.50	7.32
0.60	22.00	43.60	18.95
0.80	63.30	134.00	48.20
1.00	178.00	303.00	137.00
1.20	495.00	1,413.00	348.00
1.40	1,280.00	4,060.00	875.00

Dispersions stood 24 hrs. before measurements were made.

From Figure 1 it can be interpreted that a 1.22 per cent dispersion of gum arabic in water is considerably lower in relative viscosity than a similar dispersion of karaya. Figures for the three samples are compared below.

Sample	*Per cent of gum*	*Relative viscosity*
Arabic	1.22	1.65
Karaya C	1.22	420.00
Karaya B	1.22	570.00
Karaya A	1.22	1800.00

Thus it is apparent that if a choice is to be made between gum arabic and gum karaya for thickening purposes only, karaya is far superior and less is necessary to produce a dispersion of desired thickness. The curves are apparently of a logarithmic nature and the investigators deduced the relation that a simple logarithmic expression shows the relation between concentration and viscosity.

Native gathering karaya gum from tree trunk

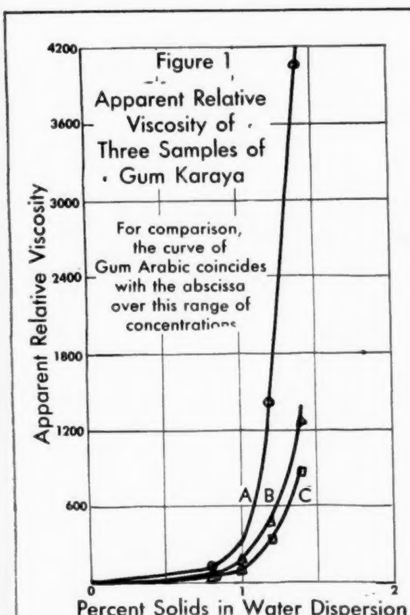
At this point it is appropriate to introduce some figures on the relationship between pressure and fluidity for three gums, karaya, arabic and tragacanth. They are the data of S. N. Glarum who used the Stormer viscosimeter for his measurements. They are plotted in Figure 2.

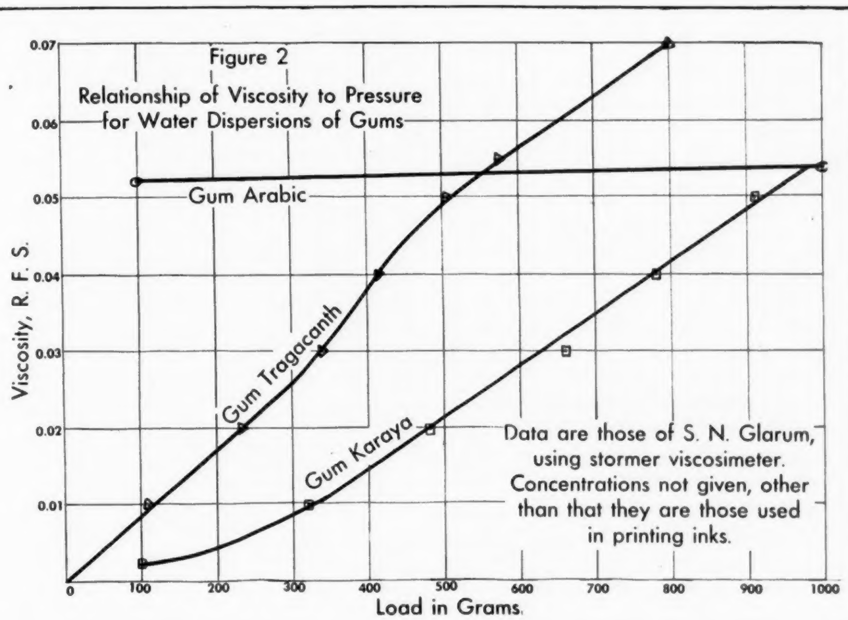
The concentrations are those used in printing pastes and were not specified by the writer. Although terms used in describing these pastes, such as long, short, thick, thin, good body and false body, have little significance and bear no definite relation to accurately measured properties, the general statement can be made that the steeper curve has the greater false body—tragacanth over karaya.

In an earlier paragraph the pH's of different samples of gum karaya dispersions were reported for the purpose of emphasizing that the properties of different shipments do not vary over a wide range in this respect and that added chemicals in the form of bases are not necessary to keep a dispersion fairly constant. However, to illustrate the peculiar properties of these dispersions in water, the pH's of one containing 1.00 per cent solids is given below as obtained by colorimetric and electrometric methods after standing for various lengths of time. The electrometric method is represented by the third column.

Standing time of dispersion in hours	*Brom-cresol indicator*	*Green quinhydrone*
0.8	4.6—	4.63
3.2	4.6	4.62
23.5	4.6	4.64
29.5	4.6—	4.71
50.0	4.6—	5.03
76.0	4.6—	5.13

In this case the indicator was added to





the water before the gum was dispersed in it. The pH remained constant by the colorimetric method but increased by the electrometric method. This can be explained by the principle of adsorption.

The increased pH values in the following table as compared with the table above can be attributed to the presence of ammonia, but the differences in the values of column three and column two of the following table can be attributed again to adsorption of acid around the particles of the colloidal gum and the slowness of the added ammonia in attaining equilibrium with it.

Solid content, gm. per 100 gm. water	*pH after immediate addition of 0.665 milli. equivalents*	*pH after same amt. of ammonia added 4 hrs later*
0.20	7.90	8.15
0.40	8.03	8.35
0.60	8.07	8.29
0.80	7.50	8.02
1.00	7.74	8.21
1.20	7.25	7.90

In an earlier paragraph a distinction was made between the acid number as determined directly in alcohol and water and that of volatile acid obtained by steam distillation of a weighed quantity of gum dispersed in five per cent phosphoric or sulfuric acids. It is interesting to observe the rate at which this volatile acid is released from freshly prepared dispersions and from those allowed to stand 24 hours. These rates are given in the following table:

One-half gram of gum was suspended or dispersed in 150 milliliters of 5% phosphoric acid and steam distilled for four hours. Each 100 milliliters of distillate was tested for total acidity. Samples 1 and 2 were prepared fresh but 2A was allowed to stand twenty-four hours before distillation.

Sample No.	*Conventional acid number per gram of sample for each forty minutes of distillation*						*Total*
1.	3.60	4.92	2.88	1.98	1.38	0.54	15.30
2.	3.84	4.92	2.88	1.32	0.60	....	13.56
2A.	2.52	3.36	3.24	2.52	1.56	0.48	13.68

In that samples one and two are separate and distinct, the figures for the total acid number differ as is to be expected, but those of samples 2 and 2A differ by about 0.4 of one per cent or more than four parts per thousand, which is a fair check upon a distillation analysis. However, the rate at which the acid is released from sample 2A is about one-third less than that from sample 2. This is attributed to adsorption of acid around the colloidal particles during the 24 hours standing before distillation.

Before closing, a few words of a practical nature should be added for those who have had no experience with this gum and perhaps wish to make a dispersion in water with the aid of heat. Some prefer to stir the dry gum into a paste with a small quantity of cold water, similar to the practice associated with starch, and then with stirring add this gradually to water which is near the boiling point. This from experience is poor practice and reference to Table II shows that even 1 lb. in 99 lbs. of water without heat is accompanied by an increase of viscosity of from 137 to 303 fold at room temperature.

When making such a dilute dispersion it would be preferable to stir this amount into the total amount of water with the aid of a colloid mill or homogenizer and allow to stand for 24 hours before use. Dispersions of 2 or 3 per cent are being made for leather cleaners by slowly adding the powdered gum to warm water and continuing the stirring until all visible lumps have disappeared.

The effect of heat on viscosity is illustrated in the following table. Five grams of dry gum (No. 60) after being stirred into 5 cc. of alcohol were added to 200 cc. of water and allowed to stand for 24 hours at 20 deg. C. The time for a steel sphere 5/32 inches in diameter to fall 2½ inches through such dispersions was noted.

Sample No.	*Time in seconds*
1.	less than 1
2.	280
3.	less than 1
4.	300
5.	135
6.	3
7.	less than 1
8.	23

Note: Samples Nos. 2, 4 and 5 were heated for one hour at steam temperature. It is apparent that the viscosity was destroyed.

It is hoped that from this unrelated set of figures and the information submitted that one not familiar with gum karaya will find his inquisitive senses sharpened and perhaps choose more wisely the set of conditions which are best for his purpose in adapting this gum to a commercial product.

WAR STIMULATES DRUGS IN LATIN AMERICA

The war has led the other Americas to expand their drug and medicine manufacturing industries.

With imports from Europe and the United States reduced by the shipping shortage, many of these countries are processing their own raw materials, to supply the needs of their own citizens.

Brazil has established its own shark liver oil industry, to produce healthgiving vitamins formerly obtained principally from cod liver oil from Norway.

The first Brazilian mill to process shark livers was started by the State of Sao Paulo early in 1943. Previously the oil had been extracted by fishermen by crude methods. With the new mill, quality improved rapidly. Shark livers are put in brine solution. The livers are cut into chunks and the chunks ground into paste. This is put under pressure and high temperature. The oil is bottled and sent to Sao Paulo, and there filtered through wool to remove stearine, and blended to maintain at least 12,000 units per gram of vitamin A.

Manufacture of quinine from cinchona bark in some of the other Americas has accompanied the rapid growth in collection of the bark from wild trees. Cinchona is native to the Andes Mountains in these countries. Years ago, however, it was taken to the Dutch East Indies, where plantations were started. These became the world's main source of quinine. With the cutting off of this supply by the war, the wild trees of the other Americas again have become the chief source of cinchona for the United States. Plantations also have been established in some of these countries.

Most of the bark is exported from the other Americas for extraction of the quinine. But Bolivia and Peru have established factories of their own. Bolivia's factory is in La Paz, and was established by the government. Peru built a quinine processing plant at Chiclayo, operated by a government commission. Two other plants have been projected.

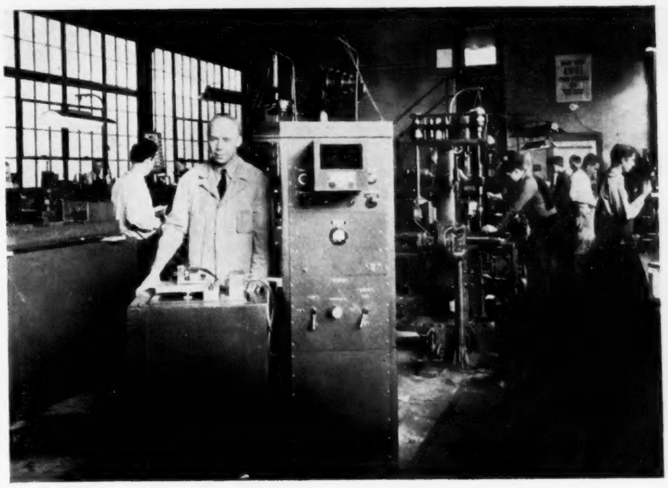
In Chile a drying plant for digitalis was installed near Osorno by the Institute de Fisiologia. Digitalis grows wild in Southern Chile, where it is presumed to have been introduced from Europe by early colonists.

Ecuador supplies the greater part of its own proprietaries. Venezuela has a fairly large number of establishments specializing in preparing simple remedies like salves, ointments, tonics and cold remedies.

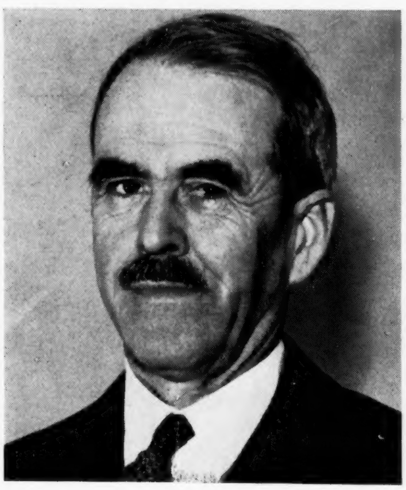
In Argentina, the government through the Bacteriological Institute of the National Department of Hygiene produced a wide range of serums, vaccines, organotherapeutic products and diagnostic reagents. The country's medicinal industry supplies most of the domestic demand. Imports usually have consisted chiefly of medicinal chemicals, petroleum jelly, mineral oil, pharmaceutical specialties, some biologics, and bulk medical materials for elaboration in Argentina.

Headliners in The News

DR. BENJAMIN J. LAZAN has been awarded the Alfred Noble prize for the most outstanding research work in any field of engineering. Dr. Lazan, who is only twenty-six years old, is chief engineer of the Sonntag Scientific Corp., an affiliate of The Baldwin Locomotive works. The prize was awarded to him for his paper on "Some Mechanical Properties of Plastics and Metals under Sustained Vibrations," at the recent annual dinner of the American Society of Mechanical Engineers in New York. Dr. Lazan is shown here at a newly-developed dynamic balancing machine.



FRANK SANDERSON MACGREGOR has been appointed to head the Electrochemicals Department of E. I. duPont de Nemours & Company. He will succeed Dr. E. A. Rykenboer as general manager of the department on Jan. 1, 1944.



D. A. BUNCE has been appointed superintendent of the Mansfield, Mass., plant of Hercules Powder Company, effective Dec. 1. He has been with Hercules since 1936 when the company purchased the Providence Dry Salters Co.

HERMAN R. THIES has been appointed manager of the Goodyear Tire and Rubber Company's newly organized plastics and chemical sales division at Akron. He was formerly assistant manager of the company's research laboratory.

DR. ROBERT C. HOCKETT has been named scientific director of the Sugar Research Foundation, Inc., a fact-finding group organized by the sugar industry. Prior to his joining the Foundation Dr. Hockett was associate professor of chemistry at M.I.T.

FRANK W. WARNER has been named successor to Henry M. Richardson as chief engineer of the Plastics Division of the General Electric Co. He has been a Plastics Division employee since June, 1931, shortly after the formation of the division.

HENRY M. RICHARDSON has resigned from the General Electric Co. to enter private practice as a consulting engineer in the field of plastic products. He will be associated with John M. DeBell, plastics consultant, of Longmeadow, Mass.

AIChE Meets in Pittsburgh

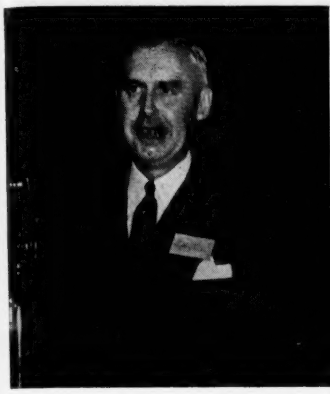
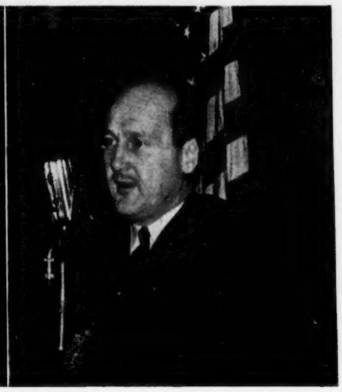
The Thirty-Sixth annual meeting of the American Institute of chemical engineers was held in Pittsburgh on November 15th and 16th. Registration at the meeting was the second highest in the history of the Institute. On this page are shown some of the active participants. For a more complete report of the meeting see November issue, page 735.

At the left: L. W. Bass, Director of the New England Research Foundation, elected vice-president; G. G. Brown, University of Michigan, elected president; and J. L. Bennett, Hercules Powder Co., retiring president.

Local committee on arrangements was composed of Oscar V. D. Luft, The Selden Co., Secretary-treasurer; J. G. Hatman, The Neville Co., Chairman; and P. J. Wilson, Mellon Institute, Vice-chairman. At the right, A. E. Marshall, president of Rumford Chemical Co., who was named chairman of committee to follow Washington legislation affecting the chemical engineering profession, chats with Dr. B. F. Dodge of Yale.

Three of the directors elected to serve terms of three years are J. C. Lawrence of E. I. du Pont de Nemours & Co., W. I. Burt of B. F. Goodrich Co., and W. T. Nichols of Westvaco Chlorine Products Co. Two others who were also elected directors but are not shown on this page are D. E. Pierce of General Aniline Works and F. J. Curtis of Monsanto Chemical Co.

H. W. Prentiss, president of the Armstrong Cork Co., and principal speaker at the annual dinner, is shown here with E. R. Weidlein, director of Mellon Institute and Martin H. Ittner of Colgate-Palmolive-Peet Co. At the right are two of the four Samarians who have gotten together at nearly every A.I.Ch.E. meeting since their trip to Europe on the *Samaria* to attend the World Congress of Chemical Engineering in London, 1936. They are A. B. Newman and R. L. Copson. The other two are Dr. Dodge and J. L. Bennett also shown on this page.

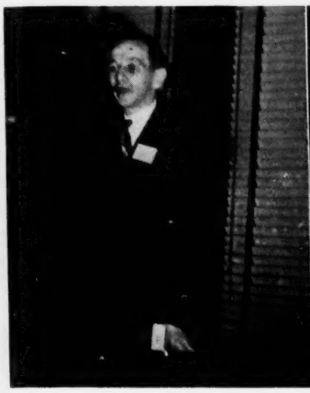
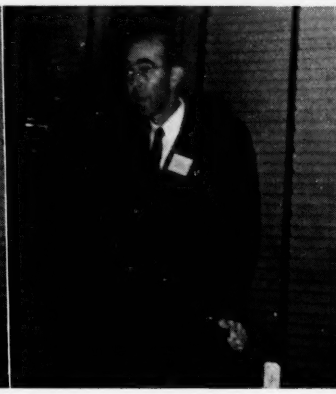



NAIDM Meets in New York

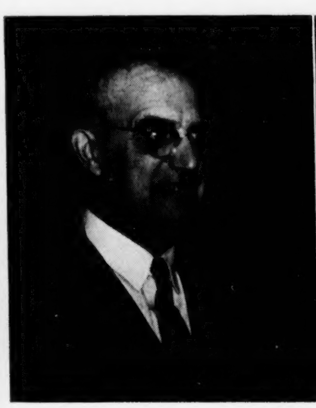
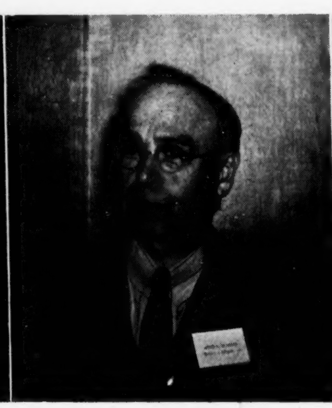
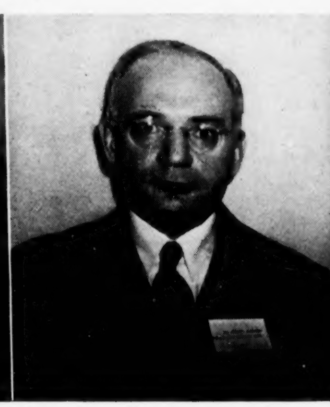
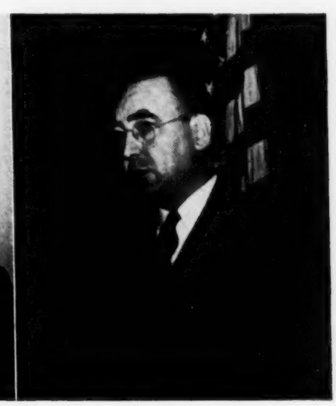
The National Association of Insecticide & Disinfectant Manufacturers Association held its 30th annual meeting in New York, Dec. 6-7. Attendance of four hundred was the largest on record. Manpower, materials, and postwar problems occupied a large part of the program. For full report see page 856.

At the left: Sterling W. Mudge, District Director, State of New York, Training Within Industry Service, War Manpower Commission, spoke of the importance of training in industry. Captain G. A. Dunnahoo of the U. S. Public Health Service addressed meeting on health problems imposed by war.

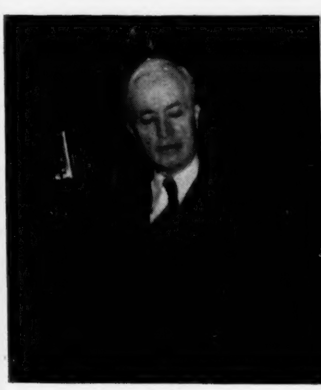
Several members taking part in the symposium on insecticide raw materials were C. E. Smith, Socony-Vacuum Oil Co.; Friar Thompson, Jr., Hercules Powder Co.; C. R. Cleveland, Standard Oil Co. (Indiana); and Eric Meyer, L. Sonneborn Sons, Inc.

The symposium on disinfectants was led by E. G. Thomssen, The J. R. Watkins Co. Two members of the panel were: B. G. Philbrick of Skinner & Sherman, Inc. and E. G. Klarman of Lehn & Fink Products Corp. At the right is L. A. Schlueter, Coal Tar Products unit of the War Production Board who discussed the tar acid supply and distribution situation.

The symposium on floor waxes and polishes at the Tuesday afternoon session had G. A. Bowden of American Home Products as discussion leader. In this meeting E. G. Delaney of Stroock & Wittenberg Corp. discussed the use of Congo gum as a replacement or extender of scarcer materials in various formulations. R. B. Trusler of Davies-Young Soap Co. advocated the use of less burnable materials for use in floor oils to lessen fire hazards. At the right is Dr. H. A. Shelanski of Smyth Laboratories who spoke on "Animal Toxicity Tests."

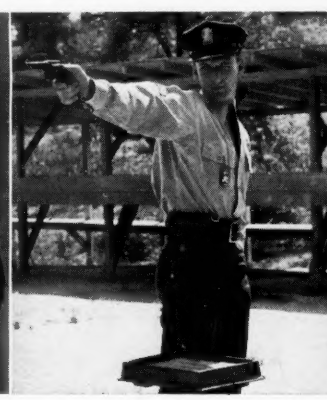


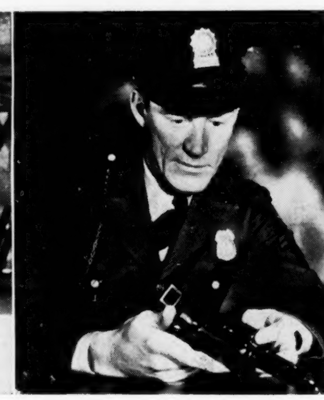

Chemical Picture News

CHEMICAL EXPOSITION: The 19th Exposition of Chemical Industries although confined to smaller space than in previous years, proved to be quite successful with almost as many visitors as in other years. At the right is CHEMICAL INDUSTRIES booth featuring "New Chemicals for Industry." Below, left to right: Bemis Bros. had an interesting exhibit showing the advances made in multiwall paper bags. Each day a bag filled with flour was immersed in a tank of water and allowed to remain for 24 hours. It was then taken out and put through a series of tests including dropping on a wooden block from a height of seven feet. Still intact the bag was then cut open to show that the contents were perfectly dry. At the extreme right Dr. Hugh S. Taylor of Princeton University presents an award to the master quartz blowers of the United States for their service to the profession of chemistry. George Fennel (left), of Hanovia Chemical & Mfg. Co. accepts on behalf of the craft.

THE CHEMICAL INDUSTRY MEDAL of the Society of Chemical Industry was presented on Nov. 12 to Dr. John J. Grebe, director, Physical Research Laboratory, Dow Chemical Co. At the presentation were, below, left to right: R. H. Boundy, assistant to president of Dow; Dr. W. Veazey, Director of Technical Research; Dr. Grebe; Wallace Cohoe, president of the Society; and Foster D. Snell, chairman of the American section of the SCI.

WARNING TO SABOTEURS: Ernest W. Houck, Hercules Powder Company plant guard at New River Ordnance Plant, wins pistol shooting tourney with a 297 score. Has a 299 score to his credit this season also. Guards from 13 of the company's owned and operated plants took part in the tourney. Joseph McCullough, Hercules Powder Company guard at Badger Ordnance Works, finished second in the company's pistol tourney.





CHEMISTRY TO THE RESCUE: The ironical situation of "water, water everywhere but not a drop to drink," which has always existed for seafarers set adrift on the oceans, is now being changed by a chemical method of desalting water. The new chemical "desalter" weighing only 3½ lbs. was developed by the Permutit Co. As shown below the kit is made up of water-tight plastic bag containing briquets and filter bag. Briquets are wrapped in pliofilm, foil and cardboard to prevent damage from salt air or submersion. Chemical de-salting takes place as briquet breaks up and converts dissolved salt into filterable sediment by process of ion exchange. The composition of briquet is still a military secret. After sedimentation the water may be drunk by sucking on tube at bottom of filter bag or by squeezing water into container.

BETWEEN THE LINES

War Increases Use of Rarer Metals

Tungsten, molybdenum, vanadium, cobalt, calcium and manganese producers and importers are shattering new high records in an effort to meet U. S. war demands. The metals are important both as alloying elements and as chemical raw materials.

THE WAR PERIOD has been marked by a growing importance of tungsten, molybdenum, vanadium, cobalt, and various other alloys and metals which not only are vital in the steel industry but serve important purposes in the chemical field. This emphasis has been signalized by recent action of the Office of Price Administration to insure tighter control over maximum prices of each. However, exemptions were carefully specified to protect essential imports, as in the case of Canadian cobalt.

As compared to the iron and steel manufacturing industries, chemical and other industrial uses consume relatively limited amounts of these metals and alloying materials, but most of these are important. Tungsten, in addition to its place in the iron and steel industries as an alloying material imparting toughness and hardness to their products, is used by chemical manufacturers in a number of ways.

It serves as a catalyst in the manufacture of high octane gasoline, in flameproofing compounds for cloth, and in tanneries. Tungsten metal powder is used in the electrical and carbide industries.

Molybdenum, besides its use as a substitute in more recent times for tungsten, because of certain common characteristics, and other uses in alloying, has a number of uses in chemical production. Vanadium, like molybdenum, is primarily used as an alloy in metals, enhancing the tensile strength of steel without weakening its other properties, but in compound form, is used as a catalyst among other things.

Metallurgical uses of cobalt have been greatly expanded in more recent years, but its principal uses in pre-war manufacture were in ceramics, protective coatings, ink manufacture, and various chemicals. Today about half of the cobalt consumed in the United States enters into heat-resistant alloys used for high-speed cutting tools, and more than 90 percent of all domestic use is in metallurgy.

The source of supply of these ores is partly domestic and partly imports.

The United States in peace was able to meet about half of its tungsten ore requirements from domestic resources. Since the war a substantial area of the world from which imports were received normally, has been shut out, such as China, British Malaya, and Thailand; other areas have assumed correspondingly increased importance—Australia, Bolivia, Mexico, Peru and Argentina principally.

The domestic industry is largely maintained by some thirty companies, producing tungsten ores and concentrates that account for more than three-fourths of present output. Certain high-cost producers in addition, are now selling their production to the Metals Reserve, which can pay above the world-market price. This government corporation, in fact, serves as a stockpiling agency not only for all imported ores but for certain other domestically-produced ores as well. Metals Reserve sales account for approximately three-fourths of tungsten ores and concentrates consumed. About 20 concerns are engaged in processing tungsten ores.

It is estimated that the 1943 combined value of tungsten products, ores, and concentrates consumed will amount to $95,000,000 or more, compared to the $6,000,000 average annual value of ferrotungsten alone for 1936-40, and the $6,-525,000 total average annual value of ores and concentrates consumed in the same years.

Sources of Supply

Molybdenum is largely a domestic product, the United States supplying about 90 percent of the world output in the pre-war era. During that time about 70 percent of production was for export. Exports are still permitted, under close export-import or lend-lease control, and this country also imports small quantities in the form of ores and concentrates. The combined value of molybdenum products and ores and concentrates produced in 1943 amounted to more than $95,000,000.

Vanadium used in the United States is about 35 percent imported, chiefly from Peru, with minor quantities of low ores coming from South Africa. Small amounts are obtained supplementally from flue dust, from boilers burning Venezuelan oil, from Idaho-mined phosphate rock, and from certain multimetallic ores found in Arizona. The South African contribution is a small amount of lead vanadate ore.

The United States is in what appears to be a peculiar position on cobalt. Almost entirely dependent in pre-war years on imports, the war changes do not appear to have altered this fundamental fact, but have given it an odd twist.

In pre-war years the major part of this country's supply came from Belgium. That country first took ores and crudes produced in the Belgian Congo, converted these to metal, oxides, salts, and hydrates, in which shapes they reached the United States.

Upon the occupation of Belgium by Germany in 1940, Belgian cobalt interests arranged to import the crudes into the United States, and their conversion is being effected in a number of American plants under a toll agreement. About 90 percent of domestic output of cobalt products comes under this head, and the operation of the entire program is integrated under foreign control.

Small amounts, however, of metal, oxides and hydrates were being produced by a domestic concern which has, since the war, expanded its production. Furthermore, Canada supplies smaller amounts of ores and crudes which are converted by one plant in this country to oxides and hydrates. In the past two years the only imported cobalt products, as such, have been of Canadian origin, in the form of metal.

Such situations perhaps explain why the OPA, in its price action, has applied its regulation to all sales and deliveries within the United States, of tungsten, molybdenum, vanadium, cobalt, and certain special alloys, but has exempted from control the importation of processed materials of these categories. However, their resale in the United States is subject to the same maximum prices as on the domestically produced materials.

In normal times importation in processed form of tungsten, molybdenum, vanadium, and other metals or alloys was very limited, the United States industries importing the ores for processing. Imports of processed materials had virtually ceased in the first half of this year, as was the case during 1942.

Calcium metal also has undergone a war change. Until the outbreak of war it was imported from France. Now one American company supplies all domestic requirements. The history of this change is that in the realization that a war would interfere with the one source, France, a ferro-alloy producer in the United States undertook experiments that led to introduction of the domestic product as early as the summer of 1939.

NEW PRODUCTS & PROCESSES

Mildew Preventives

Various chemical formulations have been devised which, when applied to textiles in the finishing bath, serve to render the materials completely antiseptic, and impart lasting bacteriostatic and fungistatic properties to them, according to a recent statement issued in behalf of Gallowhur & Co.

The technique, known as the Puratised Process, probably will not be generally available for application to textiles for civilian use until after the war, but at the present time military fabrics and other war materials are being subjected to the treatment in the course of their manufacture. Over twenty million pairs of shoes have been completed with Puratised linings to eliminate loss from mildew, as well as to safeguard the shoe linings from destruction by Trychophyton interdigitale (Athlete's foot).

The term "mildew" as used in the textile industry denotes growth of the common saprophytic fungi. The first noticeable effect of the damage caused by this microscopic life is that the affected material becomes spotted and discolored; the fungus manifesting itself either by its own color or by the degradation of the dye or pigment. It also may affect the dyes of finishing materials so that the discoloration ensues. This discoloration invariably is accompanied by a musty, disagreeable odor created by the action of the bacteria and fungi. In the final stage of growth the fungi or bacteria cause decomposition of the yarn and, in a short time, the affected cloth will be weakened or "tenderized," ultimately rotting away.

Once material is attacked by bacteria or fungi, there is no certain treatment which will remedy their deleterious action. Sterilization, once thought to be the solution is not the answer, though for the moment it definitely destroys all organisms on fabric. Shortly after the fabric is removed from the sterilizer, however, its surface is again exposed to the airborne organisms.

Since the advent of the present global war, the demand has been greatly increased for some process which would actually inhibit the growth of bacteria and fungi and at the same time not change the appearance or physical characteristics of the material.

In working on this problem, Dr. Frank J. Sowa, research chemist for Gallowhur & Co., determined the general qualifications for chemical formulations that would render a fabric antiseptic and make it lastingly bacteriostatic and fungistatic. With these qualifications in mind and with the collaboration of many organic and textile chemists, formulations were obtained which accomplished the desired results. Some of these formulations for textiles are described below, while there are several others for use with leather, paint, paper, plastics and rubber.

Puratised Process Formulations N5-X, N5-D and N5 may be introduced into the material by way of the aqueous phase or oil in water type of emulsion and then insolubilized, for all practical purposes, in situ in the fibres at a temperature range upwards of 200° F. In the water insolubilizing step, where the active ingredient is formed in situ, there is, in part, a combination of the active ingredient with the cotton, rayon, wool or silk molecules to become an integral part of these molecules. In other words, to a limited extent, there is formed a new textile yarn; one which is resistant to the growth and propagation of bacteria and fungi life.

The Puratized N5-X formula, introduced into the feed water in the finishing plant, will destroy any bacteria or fungi and thus off-set one of the commonest sources of contamination in the mill.

Puratized LN is a formula especially designed so that it can be introduced by way of hydrocarbon or organic solvents or emulsions and it is one which can be used where material so treated need not necessarily be dried at elevated temperatures such as when it is incorporated in a waterproofing or fireproofing coating composition for treating various fabrics to render them fireproof, mildew-proof and waterproof.

Such products as viscose rayons, cellophane, and alkali soluble cellulose finishes may be treated with Puratized PC. For example, Puratized PC can be incorporated into viscose solution previous to extrusion to make either rayon yarns or cellophane wrapping material. With alkali soluble cellulose finishes, Puratized PC is incorporated in the alkaline bath after which it is padded into the fabric and subsequently acidified and neutralized.

Puratized B 2 is prepared in solid form and is primarily intended for rubber and for use in dispersions in conjunction with fireproofing or pigmented finishes for textiles.

Synthetic Shellac Produced

The development of synthetic shellac was announced recently by the Arthur D. Little laboratories. The new product will relieve the serious shortage of natural shellac, which is normally imported from India, but since Pearl Harbor has not been adequately available, even for essential uses. Mr. C. G. Harford, the inventor, stated that extensive practical experience reveals the new shellac as essentially a duplicate of the natural product, but surpassing it in some properties, such as adhesion to metal as well as wood and subsequent resistance to water. The synthetic shellac is made from available domestic materials. Mr. Harford previously developed processes for the manufacture of one of these raw materials, the corn protein zein, and has developed a number of new products in his special field of protective coatings.

The new shellac is being manufactured under the name "Zinlac" by William Zinsser and Co., New York, and is available for essential wartime applications. It is being used now in shipbuilding, life rafts, communications, gas masks, fuses and other military products.

Natural shellac, the hardened secretion of an Indian insect, has been virtually unique in its combination of hardness, wear resistance, speedy drying and solubility in cheap solvents. These qualities, which prompted its use in such diverse fields as floor protection and fine furniture finishing, had not previously been duplicated despite years of effort both here and abroad.

New Styrene Process

A novel catalytic process has been developed by Dominion Tar and Chemical Co. for the production of styrene and nuclear substituted styrenes. Products already manufactured by this method, apart from styrene, include monomeric p-methyl styrene, m-dimethyl styrene, and o-dimethyl styrene. These modified styrenes are crystal-clear liquids, readily capable of polymerization and copolymerization to form plastics possessing properties which are in some respects superior to those of ordinary polystyrene.

Although wartime regulations prohibit publication of process details, it is acknowledged that this method permits commercial manufacture of a wide range of substituted styrenes, by the incorporation, for instance, of ethyl, propyl, butyl, and kindred groups. All such compounds are capable of being polymerized, individually, or in combination, to yield many interesting new thermoplastics.

Another range of new chemicals can be created likewise, based on furan, pyridine, or similar materials. The company is at present completing pilot plant extensions to its laboratories to further research investigations.

Canada hitherto has had no commercial output of polystyrene resins, and currently has only one styrene producing unit, rated

at 10,000 tons, operating in conjunction with the synthetic rubber program. It is probable that the new process will not be exploited fully, except for special war purposes, until raw materials are more readily available.

Skintight Packaging

A new translucent "skintight" packaging material, recently developed by The Dow Chemical Company in response to an appeal from a maker of amphibian vehicles, is now being used to save time and manpower at home, and speed the work of assembly and repair crews at the front. The product, which has an ethylcellulose base, is a plastic-like substance, applied by a simple hot dip process. It sets into a tough, skin-tight coat in a few seconds that fully protects the metal from rust, corrosion and dirt during shipment. Assembly crews find it strips off quickly and easily with no more equipment than an ordinary pocket knife.

Although the material used is not yet available for general distribution, being under rigid government control, a company statement says that production experts believe it will eventually revolutionize this entire phase of packaging procedure for civilian as well as military equipment. Previous methods frequently required hand-wrapping of parts in a special grease-proof wrapping material followed by dipping in hot wax, or an alternative process of pre-coating the parts with a heavy grease which was difficult to remove in the field. These grease-coated parts likewise had to be hand wrapped before shipment.

The types of parts which can be treated by the new process are not yet completely defined. Its use is already apparent in many cases. Adaptations of method are constantly being extended under rigid military supervision. Actual production costs, ordnance men declare, already indicate packaging time reductions up to 80 per cent.

Aliphatic Aldehyde Process

Celanese Corporation of America was recently granted a patent for production of aliphatic aldehydes.

According to the invention glycols, such as ethylene glycol or propylene glycol, are subjected to the action of heat while in the vapor form and in the presence of an acid reacting salt and a limited quantity of water. This process gives commercial yields of acetaldehyde or propionaldehyde with such starting materials.

Belt Repair Material

Industrial So-Lo, a product for repairing breaks, burnt or worn spots, filling holes and for resurfacing industrial belts of all types—rubber, rubber composition, leather, and cotton, is now being made with synthetic rubber. The manufacturer claims it will greatly lengthen the life of belts and permit continued use of some conveyor belts that might otherwise be discarded. It is said to be easily applied, dries tough overnight, and to have a coverage of approximately 14 square feet per quart.

Other advantages are also claimed for Industrial So-Lo in its new form. It is said to have greater resistance to oil and grease, less shrinkage, spreads easily, and dries more smoothly. The product consists of a cement primer and a mastic. The belt surface is roughened and the primer applied. The mastic is then spread on.

Industrial So-Lo is also used for resurfacing metal, wood, and composition pulleys, to which it readily adheres, preventing slipping and cutting down wear.

Solvent and Cleaner

A combination solvent and alkaline cleaner, called "Running Gear," has been put on the market by the Technical Processes Division of Colonial Alloys Co. The product, an emulsifiable type cleaner, is said to be designed for quick removal of oils and solid particle dirts and greases, especially those which are very hard and caked on.

According to the company, the material is mixed with three to ten parts of kerosene or mineral spirits, depending on the severity of the cleaning job. It is applied by either dipping or spraying, allowed to soak for from one-half to thirty minutes, depending on the job to be done, and then drained. The object to be cleaned is then washed with a pressure hose or rinsed in a dip tank with either hot or cold water. The hot water is said to be more effective in some cases.

Since the emulsification takes place in the water after the application of the "Running Gear," the solution or solvent does not quickly become loaded with the oils or greases which are removed.

Biological Stains

The war has brought about something like a ten-fold increase in the demand for a particular group of dyes known as "biological stains," according to Dr. H. J. Conn, bacteriologist at the State Experiment Station at Geneva, under whose supervision this particular type of dyes is tested and standardized.

Biological stains are made up of a special group of dyes which are used chiefly by scientists to make tiny objects, such as bacteria, more visible under the microscope, and are absolutely indispensable in the diagnosis of many diseases and in biological research. Also more recently, some of these stains have been found to have value as drugs to combat certain infectious diseases.

"The present unprecedented demand for stains has caused new problems both for the manufacturer and for the scientists using them, and there has been danger that the speed with which new batches of dyes must be manufactured would result in lowering the quality," says Doctor Conn, who continues, "Although the present big demand comes from the Army and Navy rather than from agriculture, the importance of stains to certain lines of agricultural research is great enough to require constant vigilance in maintaining their quality."

Soon after the last war a national Commission on the Standardization of Biological Stains was established, with Doctor Conn as its head. This Commission is a cooperative enterprise between American dye manufacturers and representatives of various scientific groups interested in sources of reliable stains for research work and routine laboratory tests, particularly in the field of public health. The chief functions of the Commission are to standardize the stains offered for sale in this country and to stimulate research in stains and their use. Stains approved by the Commission may be sold under a certificate from the Commission. At present about fifty biological stains are on the certification basis.

Emulsifier and Wetting Agent

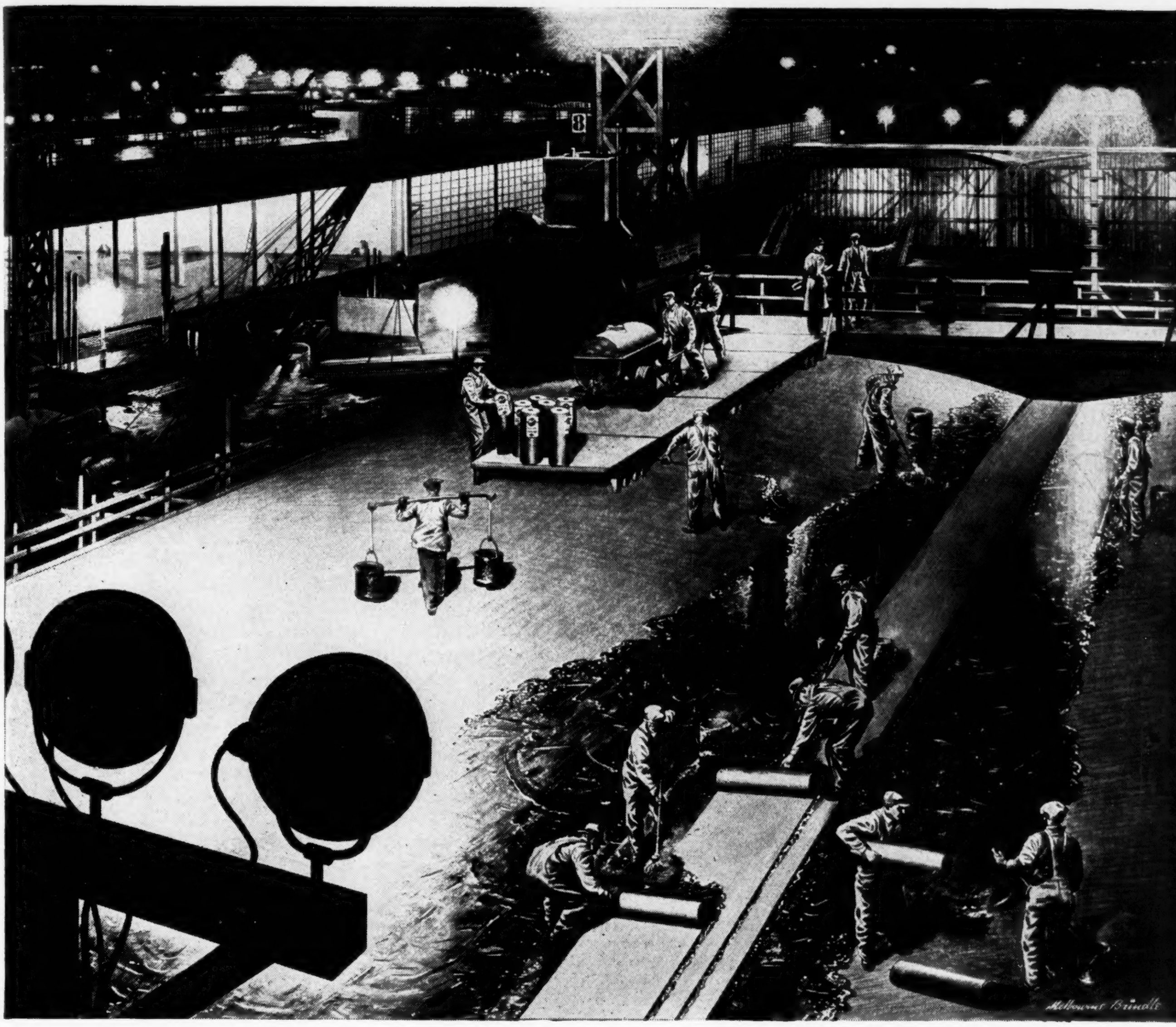
Union Bag & Paper Corporation is now offering a by-product of the paper industry as an industrial raw material. The new product, called Unitol E, is composed of fatty acids and rosin acids. It is claimed to be a first class emulsifier and to have excellent wetting and penetrating properties. A company statement says that it is comparable to oleic acid, when used in disinfectants and that it is also being adopted for application in insecticides.

Saran Innersoles

Among new wartime uses of modern plastic materials is the Saran screen innersole developed recently by the Quartermaster Corps for use in jungle boots and other military footwear.

The soles, made up of several layers of Saran screen stitched or welded together at the edges, are resilient, flexible and tend to ventilate the bottom of the foot. This latter characteristic is expected to aid in the control of fungus foot infections, such as athlete's foot, which are prevalent in humid climates.

Since the Saran plastic absorbs no moisture the soles may be washed quickly with soap and water, gasoline or other common cleaning agents and so can readily be kept in a sanitary condition.



The under-cover story of America's war production

● They moved in at night—one of the fastest, most efficient mechanized forces the world has ever seen...Exactly 241 days later they moved out, and behind them, where a prairie had been before, was one of the greatest industrial units in the world—under the cover of a single roof.

Our part in the story of the building of America's vast production facilities includes the Barrett Roofs which today protect scores of wartime giants built for the Army and the Navy, for Ford, Curtiss-Wright, Glenn L. Martin, North American Aviation, United Aircraft and many others. Thus Barrett Roofs, like many other Barrett basic products, are contributing to help keep this nation strong in war.

Today Barrett Toluol is being used for TNT...Benzol for Tetryl...Phenol for plywood planes...Anhydrous Ammonia for nitric acid...Phthalic Anhydride for ship, tank and truck finishes...Dibutyl Phthalate for smokeless powder...Pyridines for sulfa drugs...Quinoline for vitamins...Rubber Compounding materials for extending vital rubber supplies...

Because these and scores of other Barrett basic products are required to speed the manufacture of the nation's war weapons, deliveries for civilian use may have to be curtailed or delayed. All Barrett's plant facilities and 89 years of manufacturing experience are being utilized to keep production at top speed to meet the increasing demands of essential wartime requirements.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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BARRETT COAL-TAR CHEMICALS: Tar Acids: Phenols, Cresols, Cresylic Acids • Naphthalene • Phthalic Anhydride *Cumar (Paracoumarone-Indene Resin) • Rubber Compounding Materials • Bardol* • Barretan* • Pickling Inhibitors • Benzol • Toluol • Xylol • Solvent Naphtha • Hi-Flash Solvent • Hydrogenated Coal-Tar Chemicals • Flotation Agents • Tar Distillate • Anhydrous Ammonia • Ammonia Liquors • Sulphate of Ammonia • Ammonium Nitrate • Arcadian*, the American Nitrate of Soda

Barrett

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ONE OF AMERICA'S GREAT BASIC BUSINESSES

NEW EQUIPMENT

Drop Bottom Skid Box QC326

Fast, efficient handling of small parts in bulk is one of the many materials handling jobs now being performed by lift trucks. The adaptation of Towmotors made by the Towmotor Corp., to this problem is made possible through use of a new type drop bottom dump skid box designed and manufactured by the Union Metal Manufacturing Company, Canton, Ohio.

Materials handling of small parts in today's war plants often involves several transfers of such parts along crowded production lines, and the final movement to inspection tables or freight cars. Unloading, in particular, is a phase which has proved expensive in terms of manpower and time.

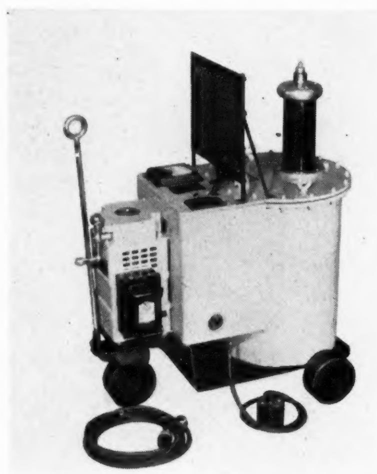
The drop bottom dump skid box on a Towmotor speeds up the materials handling job, but does it with substantial savings in both time and labor. The metal skid box mounted on the regular Towmotor forks is large and strong enough to carry the equivalent of several hand-truck loads.

The skid box, available in several sizes, is carried at normal level to the point of unloading. Here it is lifted toward the top of the Towmotor hoist and the back of the box is secured by loops to the upper cross arm. Lowering the forks—with the back of the box in this position—dumps the load.

Voltage Test Set QC327

A newly designed 50,000-volt portable test set for use on single-phase, 115- or 230-volt, 50- or 60-cycle circuits has been announced by the General Electric Company. The set is intended for application in cable factories, industrial plants, central stations, laboratories, and wherever high voltages up to 50,000 volts are required for testing electric apparatus or insulating materials.

This 50,000-volt (5-kva) portable set combines in a compact unit an oil-insulated testing set, a highly accurate indicating voltmeter, a voltmeter selector switch, and complete control equipment, such as air circuit breaker, line switch, foot switch, and induction voltage regulator. The testing transformer is designed with liberal safety factors to withstand the stresses encountered in testing service. A screened safety guard separates the operator and the high-voltage bushing, and a red light warns the operator whenever the set is energized.



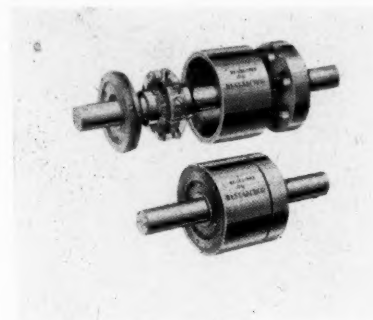
The indicating voltmeter has a large dial which shows the applied test voltage in kilovolts. For greater accuracy throughout the complete range, the meter has a double scale—one for voltages up to 25 kv and the other for voltages from 25 to 50 kv. The meter is connected to a voltmeter coil wound on the main transformer. It gives a highly accurate indication of the actual test voltage under all conditions.

The three-wheel truck on which the set is mounted is provided with roller-bearing mounted wheels, and a ball-bearing mounted swivel joint for the front wheel, providing easy portability.

Centrifugal Clutch QC328

The Amalgamated Engineering & Research Corporation has announced a new type of automatically engaging and self-disengaging centrifugal clutch. This new clutch which can be produced in an unlimited range of sizes and capacities, can serve either as a coupling between shafts or as a driving pulley or gear in a transmission, as well as a starting cushion between power units and driven mechanisms.

This new unit which is known as the "Torkontrol" consists of a partially filled oil chamber fitted with a freely rotating hub, which carries a series of movable wedge-shaped flyweights. As the hub revolves these weights fly outwardly and engage the internal rims of the outer case binding the hub and shell into a functionally solid pulley or coupling.



This unit works equally well in either direction (hence is reversible) and is "set" to engage or release at a given speed, and to slip in case of overload.

The manufacturer claims that this unit permits the use of smaller engines or motors which start without load, give smooth cushioned application of power, straight line acceleration with resulting saving in operating cost.

According to the company clutches have been built in all sizes from ¼ H.P. to 500 H.P. for both built-in and general application.

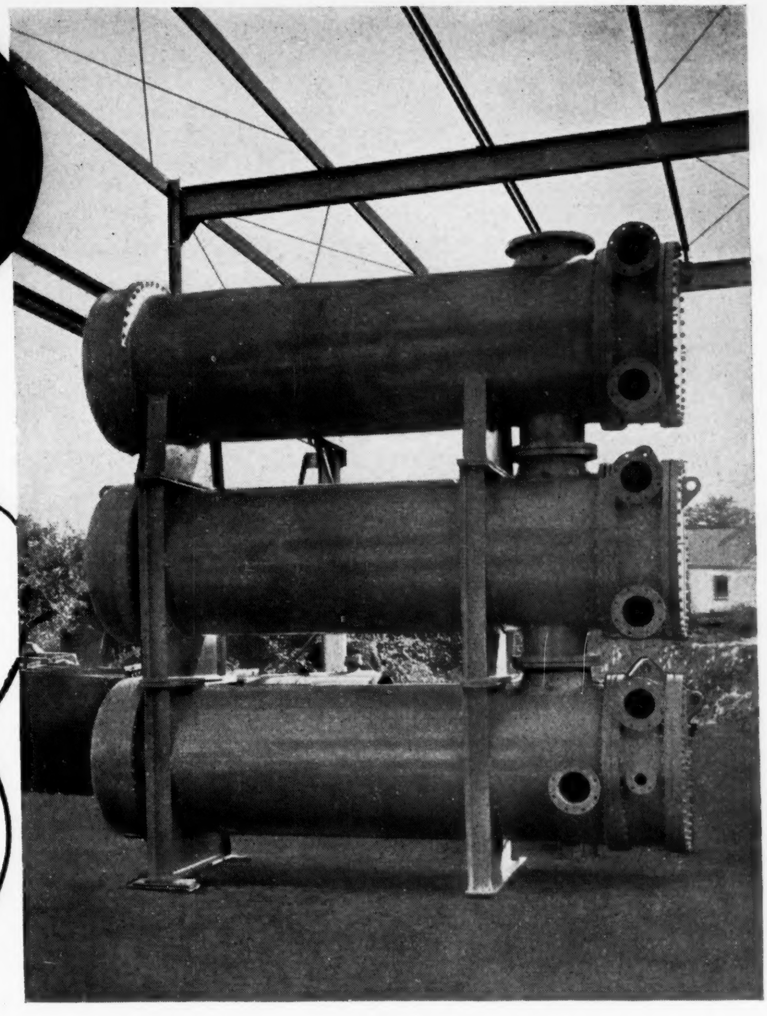
Metal Cleaning and Rinsing Tank QC329

Two hot liquid dip tanks in one portable unit feature the Twin Dipmaster developed by the Aeroil Burner Company, thus enabling the operator to clean and rinse metal parts and products without the necessity of carrying them to a second tank for hot or cold rinsing, it is claimed by this manufacturer. Equipped with two insulated compartments separated by a partition that is also insulated, the Twin Dipmaster has two removable immersion tube heating units (one for each tank) that deliver all the heat in the cleaning solution and rinse water. Separate, automatic heat control for each compartment is supplied by two thermostats regulating any required temperature from 110-550° F. and they operate independently of one another. In addition there are two built-in thermometers registering temperatures from 100-600° F. and four dipping baskets.

Completing the standard equipment are scum gutters, draw-off cocks, an insulated cover, pipe connections for the addition of fresh water to the rinse compartment as well as to drain off contaminated liquids

Typifying
PATTERSON - KELLEY
Service and Products

"Tailor Made"
THREE-STAGE STACK HEAT EXCHANGER



Design statistics include: straight tube; floating-head with split backing ring; removable heating section. Steel shell, tube heads, channels and covers; Admiralty tubing.

Equipment that is "tailor made" is never delivered immediately...even in normal times. It's not shelf goods. But even today, under the stress of wartime scarcities of labor and materials, we are able to turn out special jobs in exceptionally fast time.

At Patterson-Kelley there are three factors that make this possible:

1 ... Highly trained engineers with a specialized background to enable them to solve your particular problem.

2 ... Old hands in the shop who have, for years, been constructing all types of heat transfer and pressure vessels. They know the specialized techniques and materials used in the field.

3 ... 63 years experience in design, construction and installation of specialized heating equipment.

This illustration shows one of these fast jobs. It's a Patterson-Kelley Type E 3 Stage Stack Heat Exchanger, built to special order like so many Patterson-Kelley products. It solved a refinery's heat-transfer problem. If there is a heat-transfer problem in your plant, why not write or call us? We can give it immediate attention.

EST. 1880

THE PATTERSON-KELLEY Company, Inc.

Main Office and Factory 112 WARREN STREET, EAST STROUDSBURG, PA.

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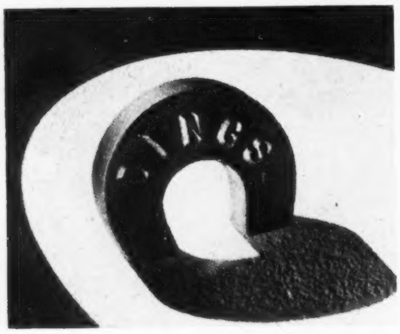
12-PK-7

and two work grilles on which bulky parts can be rested during the cleaning and rinsing processes.

Test Magnet QC330

A horseshoe-shaped Alnico magnet measuring 2½" high by 3" wide with pole bases ¾" x ¾", suitable for test work in chemical, physical, and mineralogical laboratories as well as in smelting

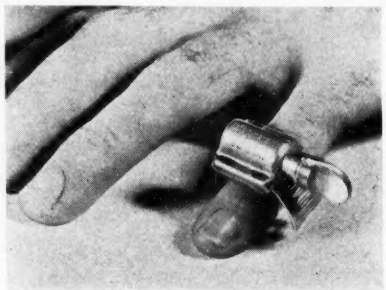


and refining plants and others, is available through the Dings Magnetic Separator Company.

Hose Clamps QC331

The Aero-Seal line of Hose Clamps, manufactured by Aircraft Standard Parts Company, now covers, in 16 models, all sizes of standard aircraft hose from ¼" inside diameter up to 4". The new additions are models M-6 and M-10 for hose sizes from ¼" to ¾" inclusive. The M-6 is designed for ¼", ⅜", and ½" hose and the M-10 for ⅝" and ¾" hose. By using the extra take-up in the band, the M-10 can be used on all five sizes of hose from ¼" to ¾" I. D.

This feature of long take-up gives this line of clamps a wide clamping range. The band is a spring steel strip perforated to correspond with the teeth of a worm gear. It is drawn through the housing by a worm thumb-screw which provides rapid action in tightening the clamp. Since the perforations in the band extend for nearly 3½", the clamp may be taken up a full inch (in the larger sizes) on diameter. This feature will be found valuable where some sizes of clamps may be missing from stock, in which case a larger size can be used and simply drawn up until it is tight.



Long take-up is also a useful feature where the clamps are to be applied to the self-sealing type of hose, which has a wall that is thicker and softer than standard hose. This requires that the clamp be taken up further in order to obtain the necessary tightness. According to the company these hose clamps do not require lock wire.

Refractometer QC332

Engaged in the continuous production of butadiene, the Shell Development Co. encountered the problem of instrumentation, capable of indicating the purity of the products as it flowed through a processing pipeline, since continuous production makes it impractical to collect samples for removal to a testing laboratory.

Forced to develop an instrument for

the purpose, as no commercial instrument was available, the Shell technical staff found a solution to their problem in the measurement of the physical factor of refractive index as an indication of purity of butadiene. Since butadiene under atmospheric pressure boils at 19° C., refractometric readings must be made either under pressure or at decreased temperature. With this new instrument, readings are taken at the pressure at which butadiene is produced.

The Precision Scientific Co., through an agreement with the Shell Development Co. is manufacturing and marketing the Shell continuous flow pressure-type refractometer.

The instrument embraces a refractometer, with dipping prism mounted in a pressure cell through which the liquid, whose index of refraction is to be measured, flows continuously under the pressure existing in the process flow-line, while being maintained at constant temperature. Both pressure and temperature maintained within the instrument are adjustable to meet individual installation requirements and applications.

Valve Control QC333

New capabilities, as well as new convenience and sturdiness, are claimed for a new "Vernier Valvactor," just announced by The Foxboro Company. The new instrument is a micro-positioner, for pneumatic motor valves. It is used to insure precise and dependable valve response, especially where operating condi-

tions may make the response uncertain, slow, or unsatisfactory. It is actuated by air pressure changes as slight as the equivalent of ½ inch of water, and can compel valve stem movements as small as 1/1000 of an inch.

Using the same operating principles, the new construction is said to involve a completely different arrangement of the actuating elements. New ease and range of adjustment, especially for duplexing and sequencing, and new snap action, for relay service or step sequencing of valves or damper motors, are provided by new, convenient zero and range adjustments.

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

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Please send me more detailed information on the following new equipment.

QC326	QC328	QC330	QC332
QC327	QC329	QC331	QC333

Name .... (Position) ....

Company ....

Street ....

City & State ....

PACKAGING & SHIPPING

by T. PAT CALLAHAN

Export Packaging of Chemicals

PRIOR to the war it was necessary in order to insure proper delivery of export goods to notify your broker that you had a shipment to go to a certain party in a certain country and he did the rest. It was, however, necessary that the shipper comply with the various export regulations for packaging, marking, etc., and if these were attended to, and the goods were delivered to ships, upon proper acceptance by the carrier, they would be stowed in a place on the ship and safely transported to the far ends of the earth.

T. Pat Callahan

With the outbreak of war and the decrease in ship's bottoms, together with tremendous increases in amounts of materials to be exported, it was only natural that goods exported would be subjected to far greater hazards than before. Then, with the staggering amounts of war materials for our own forces and those of our allies, including all lease lend materials, the problem of packaging safely to withstand the rigors of wartime handling became a very serious one. Chemicals which were packed in containers satisfactory for export prior to the war could not be shipped unless extraordinary improvements in packaging were employed. Products had to be packaged to withstand all hazards of moisture and water, for one does not know whether the product shipped will be stowed on open barge or is subjected to outside storage for long periods of time. Packages have to be strengthened because in a great many of the points of delivery no facilities other than manual labor are available and if unloading facilities are available, time is of the essence and extreme care cannot always be exercised.

All shippers of chemicals working in close cooperation with the various government services most definitely realize the importance of proper packaging of export materials during the war. The various government services — Army, Navy, Lend Lease, Medical corps, etc.,— have done a remarkable job in bringing to the various shippers the hazards involved in the handling, shipping and protecting of all materials going to combat zones. Several of these services have sent experts to the various war theaters to inspect and report on the condition of packages as received. After collecting all the information necessary to inform the shipper how essential proper packaging is, these services by actual photographs, movies and stills arranged to show at strategic cities the condition of goods when they arrive at foreign ports. This is very, very helpful and impresses as no other method can the folly of packaging for export unless the goods arrive in a safe and satisfactory condition.

It is far better in these times to over-package and have the goods arrive so they can be used than to under-package and have them useless after having taken up valuable space in ships, which are necessary to transport safely every ounce of necessary chemicals to insure our victory.

Steel Container Needs

The War Production Board is anxious to have estimated requirements of steel containers to be used by the chemical industry during the coming 1944 and to this end is asking all users of metal containers to anticipate their use, and to notify their container suppliers as nearly as possible the amount of containers contemplated to be used during the year. This will assist the supplier in making his request for allotment of steel governed, of course, by various restrictive orders such as L-197 and M-81.

When a supplier of metal containers receives a purchaser's estimated requirements, he will then be permitted to request steel allotment based on the estimated requirements furnished him.

It is well for all users of metal containers to survey their requirements and proceed to give as much advance information to the supplier as is possible in order that the supplier can have sufficient time to have steel allotted to him. More new steel drums are going to be required during 1944 due to the fact that the light gauge (18 or lighter) which have been converted from single trip to multiple trip containers replaced with new containers.

Reuse of Containers

A serious hazard which has always faced the Chemical Industry is the use by customers of returnable containers for storage of materials which, being different from those for which the containers were originally designed, renders them unsafe in some instances and unusable in a great many others. It is a distinct hazard to use a container shipped for one material, for storage of another, and as above stated, renders it unusable.

In handling containers which should be returned, it is well to see that precautions are taken in preparing them for return. In no case should any other materials be placed in them. Even washing of containers is frowned upon by the chemical industry as the use of water sometimes renders a container unusable. In the case of steel drums a good rule to follow is to place the bungs securely in place and return drum immediately after it has been emptied and in the case of a glass carboy, refrain from rinsing. In the return of containers which contained dry materials, all hazards can be removed if care is exercised in seeing that they are tightly closed and all evidences of any hazardous materials removed from the exterior.

Our government is calling for the return of nearly all containers for re-use and if customers will see that the necessary steps are taken, the life of containers can be extended over a long period of time.

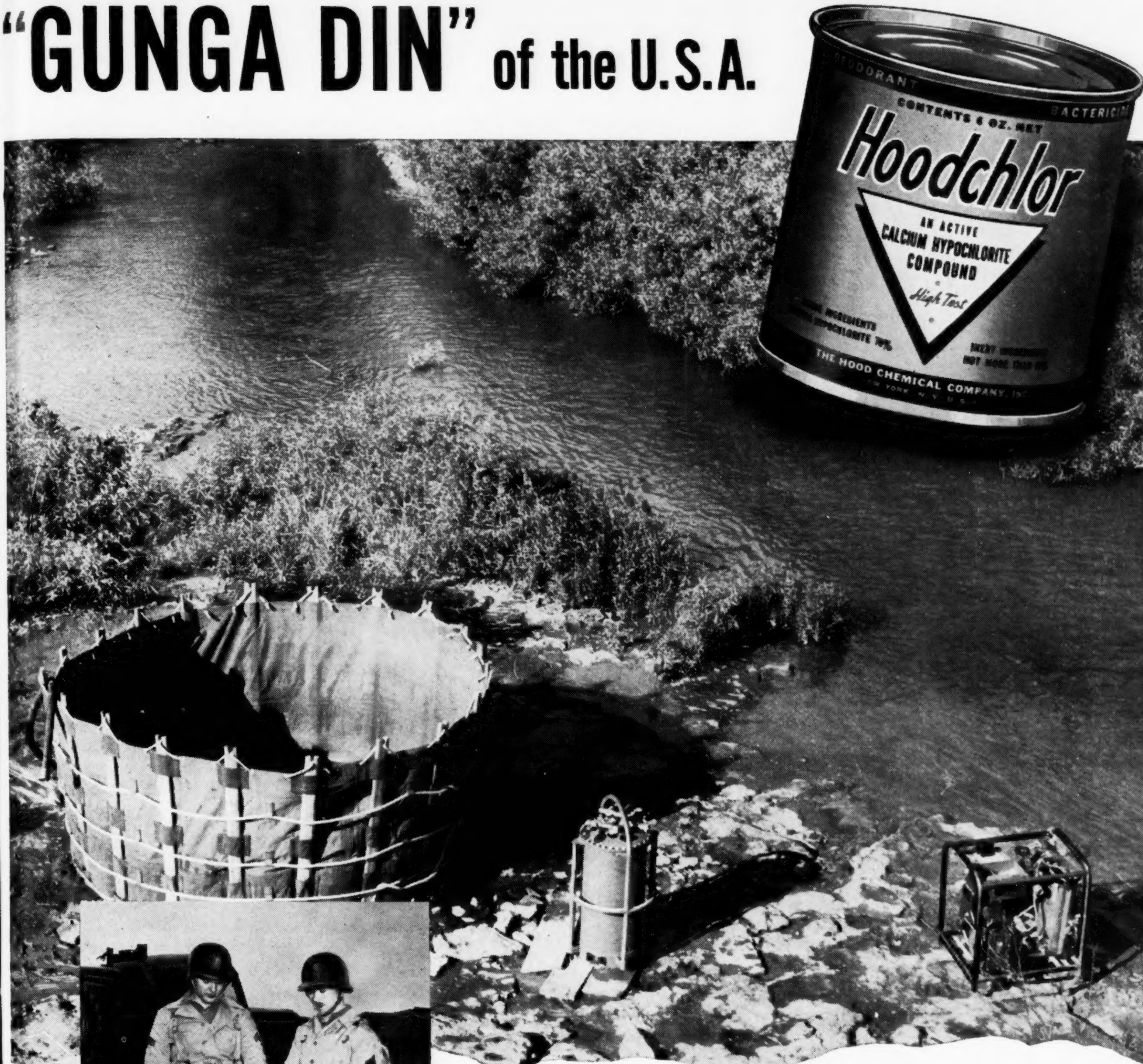
Multiwall Paper Bags

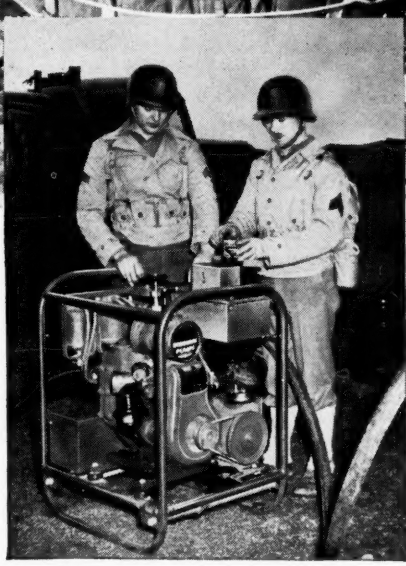
Anticipated deliveries of multiwall paper bags have been extended to as much as five months, and the situation for procurement of these containers is apt to be critical. A considerable amount of substitution for more critical container materials by Multiwall Paper Bags in the chemical industry has increased the number of these containers used, and any shortage of supply can be very serious. It would be well for all users of Multiwall Paper Bags to make a survey of impending requirements and be sure sufficient notice is given to suppliers so that anticipated requirements of the chemical industry can be handled by them.

Container Applications

A new system of handling containers is being set up in the Chemicals Branch of the War Production Board. Heretofore, all applications for the containers for chemicals were processed by the Packaging Unit of the Chemicals Division. Applications for containers which were formerly referred to the Packaging Unit of the Chemicals Division will now be passed on by the various Commodity Chiefs. Applications for the packaging of the chemicals will be first handled by the Commodity Chiefs in the various Chemical Divisions whose recommendation will be sent to the Packaging Unit of the Chemical Division for assignment of ratings and allocations. This will definitely place upon the Commodity Chiefs of the various Chemical Units the responsibility for allocation of containers for the different products which they handle.

"GUNGA DIN" of the U.S.A.





Kipling's soldiers might have relished the water that Gunga Din carried . . . even though it was "crawling and it stunk."

But U. S. Army Engineers provide far safer, and far more palatable drinking water . . . no matter what the difficulties!

"Hoodchlor" . . . product of the Hood Chemical Company of New York, is used by the Army in water purification units that go along with troops in the field. And that "Hoodchlor" is packed in three sizes of containers . . . a 6 oz. individual charge, and 3¾ and 5 lb. cans . . . all supplied by Crown!

The packaging of High Test or Grade A Calcium Hypochlorite presented many difficulties. But Crown developed a special lacquer which cut down the corrosion of containers . . . and designed a can that permitted "controlled breathing" for the escape of gases.

Another example of the way Crown ingenuity and facilities are solving problems of protective packaging.

CROWN CAN COMPANY, New York · Philadelphia

Division of Crown Cork and Seal Company, Baltimore, Md.

★ ★ ★ ★ ★ ★ CROWN CAN ★ ★ ★

PLANT OPERATIONS NOTEBOOK

Two Methods of High Frequency Heating

RAPID heating, plus the ability to create heat within the work itself are advantages of high-frequency heating that make it increasingly useful to industry. Two methods are commonly employed in this type of heating: heating nonconducting materials by a process called dielectric heating; heating metallic materials by a process known as induction heating.

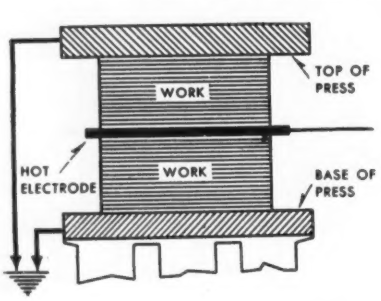
Dielectric Heating

Dielectric heating is based on the physical law that the molecules in a material can be disturbed—that this disturbance can be used to cause friction between them, and that this friction will create heat. By applying very high frequencies to a material, the molecules are subjected to a terrific disturbance, causing them to vibrate and rub together, thus creating heat. Within limits, the higher the frequencies, the greater the heat production.

To induce this disturbance, frequencies up to several million cycles per second are necessary. These are created by an electronic generator, similar to the high power, high-frequency generator used for radio broadcasting.

Dielectric heat's most important characteristic is its ability to instantly create heat within the material, instead of forcing the heat in from the outside surface. This makes it particularly adaptable to the fabrication of practically all nonconducting materials which are formed or processed by heat.

In plywood fabrication the dielectric method makes possible the heating of much thicker sections. The wood can be uniformly heated throughout, regardless of thickness. The glue is polymerized in minutes instead of hours, and there is no damage to the product.



Dielectric heating is accomplished by subjecting the work to a high-frequency field between two metallic surfaces having a relatively high difference of potential between them.

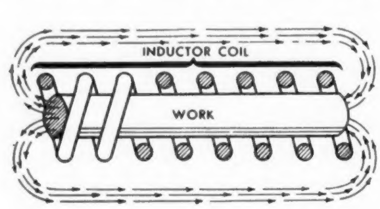
In the field of plastics, dielectric heat can be applied to almost all processing methods requiring heat. It speeds up the polymerization of the thermosetting resins, such as urea and phenol formaldehydes.

Where heat is required to induce a chemical reaction, dielectric heating has the advantages of high speed and accurate control. Other advantages claimed for this type of heating are:

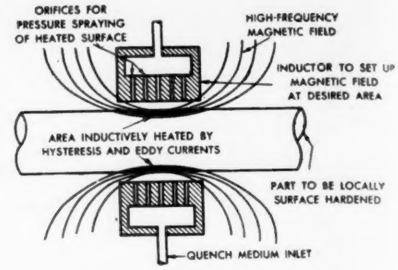
Produces heat by dielectric losses within the product itself.
Develops uniform heat throughout the product, regardless of poor thermal conductivity or thickness.
Speeds production by creating heat instantly throughout the product.
Greater thicknesses can be heated or cured.
Is not limited by high moisture content.
Can be applied without damage to the surface or change of the internal structure.
Sets glues or plastic binding materials in minutes instead of hours.
Can be quickly installed on most existing presses, using either hot or cold plates.

Induction Heating

Its unique ability to "crowd" the surface of the piece with heat, makes induction heating advantageous for surface heating. In hardening operations, it is possible to give a part an extremely hard inside or outside wearing surface, yet leave the strength and machinability of the interior intact. It can be used for brazing or soldering operations, permitting multiple processing of many parts in less time. It often makes possible simple inexpensive designs, or the use of more common, easier to get materials.

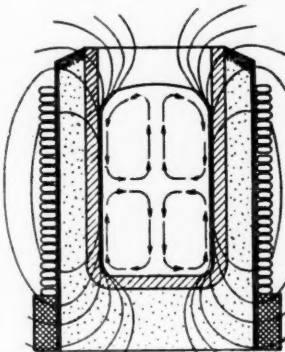


Induction heating is accomplished by converting electrical energy into heat, by arranging the work so that it is in the magnetic field created by high-frequency current through an induction coil.



Typical surface hardening block combines the coil that induces current into the work, with the quenching orfices.

Induction heating is practical for either high or low production methods. Changeovers can be made quickly, making the handling of small lots practical. For continuous production, automatic induction heating units are available. Other advantages claimed for this type of heating are:



Melting by induction is quick, and may be accurately controlled. The magnetic forces cause a constant stirring motion.

The regulation of heat input is instantaneously controlled.
Requires no physical contact between moving work and the electrical circuits.
Eliminates the time lost waiting for equipment to cool or reach processing temperatures, when servicing or making change-over adjustments.
The heat may be localized on internal or external surfaces for specific applications.
Particularly adaptable to high-speed production work—eliminating time and cost of conveying materials to and from heat-treating departments.
Accurate control of heating assures repetitive results, thus eliminating nonuniformity in the product.
Heats surface of part without affecting interior structure, where sufficient depth of material exists.
For melting applications, melts with an agitated action—thoroughly mixing the metals or alloys.

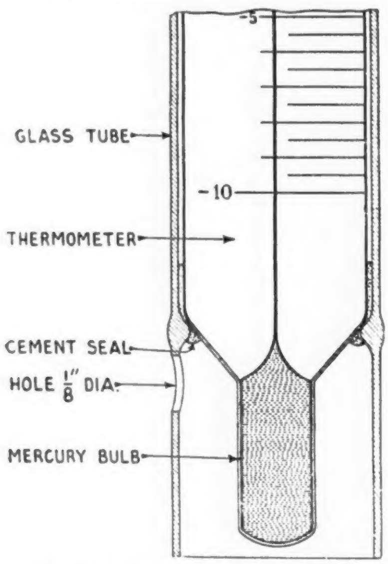
Frequencies used in induction heating range from 60 cycles to 15,000 cycles per second and are usually produced by rotating machines. By the proper selection of time, power and frequency, it can be used for thorough, uniform heating; or internal or external surface heating.

Based on information from Westinghouse Electric and Manufacturing Co.

LABORATORY NOTEBOOK

Protect Thermometers

The life of thermometers in constant use in industrial laboratories or plants is usually short. To shield the glass tube and also preserve the markings from attack by acids *The Industrial Chemist* describes the following guard.



The device consists of a piece of glass tubing slightly longer and wider than the thermometer, into which the thermometer fits snugly. A slight constriction is made in the tube about an inch from one end, and immediately below the constriction a small hole is blown in its side. The constriction is coated internally with a small amount of suitable liquid cement, such as sodium silicate. This can be done by blowing a drop of cement into the constriction from a pipette. The thermometer is then inserted so that the bulb protrudes through the constriction, as shown in the diagram. The upper end of the sheath is then closed with cement or with a rubber "policeman" with a closed end, of the type which is now on the market. The object of the small hole at the lower end of the sheath is to allow the expulsion of air by the liquid whose temperature it is desired to measure.

Removing Carbon Deposits

To clean flasks and other vessels blackened with carbon, F. C. Mathers in *The Chemist Analyst* recommends the use of potassium chlorate. Put enough potassium chlorate into the dried flask, from which as much carbon as possible has been removed by mechanical means. Heat just enough to melt the potassium chlorate and slowly rotate the flask so that the molten material flows over all the carbon. The reaction is instantaneous; after cooling, the residue dissolves out in water.

Band Viscometer

During investigations into the influence of suspended pigments upon the flow properties of oils, a new instrument, a band-viscometer, described by F. Wachholtz in *Chemische Fabrik,* was developed. It is suitable for the determination of viscosities of thick fluids and pastes at high rates of shear and at controlled temperatures.

The apparatus consists of two metal blocks M held apart by two slip-gauges S, forming a slot 150μ and 2.5 cm. deep, the edges of which are rounded off. The tops of the blocks are cut away, as shown, to form a shallow trough to hold the liquid under test. A flexible band, *e.g.,* of cellulose-triacetate C is pulled vertically through the slot by a weight G, and held taut by the smaller counter-weight g. Temperature is controlled by passing water W through the blocks.

With a constant load, the speed of the band is inversely proportional to the viscosity of the fluid under test, so that viscosities may be measured in a very simple manner. The band stays automatically in the middle of the slot and the loss of energy is negligible. It is negligible even when the band does not travel absolutely vertically, or if the blocks deviate somewhat from a vertical position. The viscosity of a liquid can be calculated with sufficient accuracy from the equation:

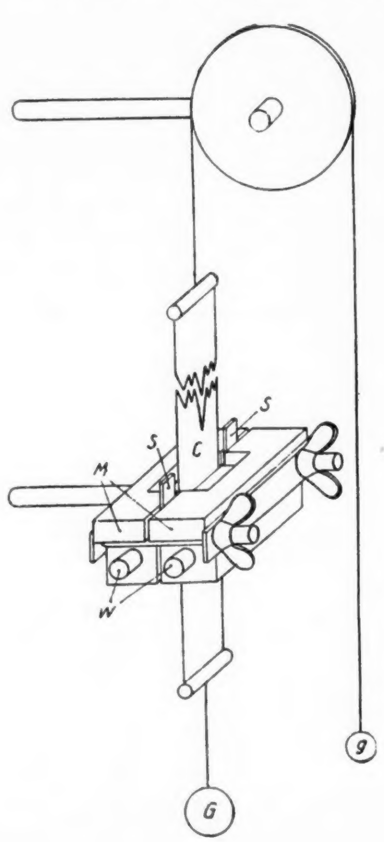
$$K = 2B.H.\frac{V\cdot}{A\cdot}\eta$$

where V is the velocity of the band, B its width, A the distance between the slot and the surface of the band, H the depth of the slot, and K the driving force. The validity of this relationship has been proved by many experiments in which K, V and A were varied, and also from the constancy of the instrument evaluated from tests on liquids of known viscosity.

When the metal blocks are kept at a constant temperature by the passage of thermostated water, heat produced by movement of the band at even high speeds does not give rise to erratic values, since the liquid which has suffered the slight warming by friction is carried away from the system on the moving band. This is a particular advantage of the band viscometer, since it allows viscosities to be accurately determined even with sticky materials at high rates of shear. Without altering the arrangement of the apparatus, a range of viscosities may be determined, of which the highest is ten times as great as the lowest.

Measurements of the viscosities of pigment suspensions in oils of different viscosities have produced some interesting results. When the viscosity, extrapolated to infinite rate of shear, is plotted against the volume percentage of pigment, curves of the same shape are always obtained, no matter what the viscosity of the oil. The shapes of the curves vary from pigment to pigment, and obviously depend upon the form of the solid. The above holds true whether the oils are of mineral or vegetable origin, though the shape of the curve changes when there is a chemical action between the oil and the pigment. A further interesting fact emerges from the study of suspensions. If the logarithm of the viscosity of suspensions of a fixed concentration in various oils is plotted against the logarithm of the viscosities of the unpigmented oils, both viscosities being extrapolated to infinite rate of shear, a straight line always results. The slope of this line depends upon the particular pigment, so that curve characteristics of the pigment may be obtained by plotting this slope against the volume content of the suspended matter.

The band-viscometer is not yet produced commercially; it still requires further elaboration, particularly to ascertain to which measurements the instrument is most suited.



INDUSTRY'S BOOKSHELF

Electronics in Organic Chemistry

ELECTRONIC INTERPRETATION OF ORGANIC CHEMISTRY, by *A. E. Remick.* John Wiley and Sons, Inc., N. Y.; 1943, 474 pp., $4.50. Reviewed by *Dr. George Glockler,* Prof. of Chemistry, University of Iowa.

THIS VOLUME shows with the utmost clarity how far removed present theoretical knowledge is from a satisfactory electronic interpretation of organic reactions. The author is to be congratulated on his valiant attempt to summarize theoretical organic chemistry on the basis of the available electrical theories of matter. He has produced a very complete description of the present scene and not only organic chemists but all chemists should read this exposition. Order is brought into a complex field by a systematic statement of the 23 basic principles which are collected in Appendix V. It is therefore easy for the reader to apply these fundamental ideas to reactions of his own particular interest.

Concerning the detailed presentation of the material it can be said that anyone could criticize many of the statements made by the author, but this situation arises mainly from the controversial nature of the subject matter and in several instances from the attempt to include certain features in such abbreviated fashion that justice cannot be done in the space allotted. Rather than enumerate these points it is felt that each reader should have the exhilarating exercise of analyzing the author's presentation.

The first and second chapters contain a historical introduction. The third chapter deals with applications of the Lewis theory of the electron concept of valency while the fourth chapter covers the general ideas of oxidation-reduction. In the fifth chapter these concepts are developed into a presentation of the electronic theory of the behavior of organic substances of the "English School." The transfer of electric charge from one atom to another by various means such as the inductive effect, the field effect, the inductomeric effect, the electromeric effect and the mesomeric effect form the basis of the discussion. It is easy to agree with the author on page 89: "One cannot avoid the suspicion that one could explain any reaction, *a posteriori,* by the simple expedient of ignoring certain of these effects, reversing others, augmenting and diminishing magnitudes until a proper balance is obtained." It is clear that the whole treatment is highly speculative and qualitative but nonetheless necessary.

The applications of the theory include the usual problems of aromatic substitution, hydrolysis, addition reactions and tautomerism. In chapters VI and VII those portions of physical chemistry are reviewed which must be considered so that a more quantitative theory may evolve from the many principles employed at present. The author himself questions the propriety of calling this theory "The electronic theory of the English School" since evidently chemists all over the world have made contributions to the progress in this field. In chapter VI the author discusses resonance, bond energies, the electronegativity scale, the strength of acids and bases, aromatic character, free radicals, hyperconjugation, Raman spectra and color theory. Considerations from the field of chemical kinetics are reviewed in chapter VII: activation energy, collision theory and the transition state. The remaining chapters are: VIII, Electrochemical Studies of Oxidation Reduction Reactions; IX, Electron Pairing Reactions; X, The Role of the Solvent and XI, Electron Sharing Displacement Reactions.

This volume should form a welcome addition to the literature of one of the most complex and certainly one of the most important fields of chemistry.

Microscope Guide

THE MICROSCOPE AND ITS USE, by *F. J. Munoz* and *H. A. Charipper.* Chemical Publishing Co., Brooklyn, N. Y.; 1943, 334 pp., $2.50. Reviewed by *John B. Calkin,* Union Bag and Paper Corporation.

IN JUDGING a book it is always best to start with its aim. The authors state: "This book is not intended as a scientific treatise but as a guide to aid technicians and students in the use of the instrument. The material contained in the present volume is drafted from the authors' personal experience and from the sources to which acknowledgment is given . . . ." The authors' experience, one as an optical man and the other a professor of biology, should fit them for the task.

This reviewer is rather against including so many illustrations from manufacturers' catalogues in technical books, believing that it is better for the reader to peruse the catalogues themselves. However, this entails extra work on the part of the reader (all be it with further reward) and may justify the large number of illustrations in this volume.

The chapter on illumination is particularly good and contains many suggestions. Chapter X on "Common Errors in the Use of the Microscope," the "Glossary" and "A Selected Bibliography" are helpful. In the latter under "Journals" the *Paper Trade Journal* and *Industrial and Engineering Chemistry* might be added. It is regrettable that none of the extensive work of Graff on fibre and paper microscopy is referred to.

It is unfortunate that possible errors in micrometry have not received the detailed consideration that they should be given.

From the above criticisms one is not to infer that the book is not a worthwhile contribution. This reviewer found the book profitable reading before being asked to submit a review.

Laboratory Data Tables

PHYSICAL CONSTANTS OF THE PRINCIPAL HYDROCARBONS, 4th edition, by *M. P. Doss.* The Texas Co., N. Y. Published at request of the Technical Advisory Committee of the Petroleum Industry War Council, 1943, 215 pp., $3.75.

PREPARED for laboratory workers, these tables are designed to give data on a particular hydrocarbon which may not be listed in handbooks available in most laboratories. While this tabulation is not complete, it lists most of the aliphatic hydrocarbons so far isolated or synthesized. This is also true to a lesser degree for the cycloparaffins (naphthenes) and such unsaturated ring hydrocarbons as the cyclo-olefins, etc., as well as the mononuclear aromatics. Only the principal members of the polycyclic series are given, mainly those that have actually been isolated from petroleum residues, such as picene, pyrene and anthracene.

According to the introduction, where there is disagreement in the literature with regard to certain values, the most recent data have been used. In some cases, calculated values have been employed, particularly heats of vaporization and combustion, but in all instances the data given are accompanied by the literature references.

More than 100 pages in the new edition have been revised to include new and corrected data, particularly on the hydrocarbons related to the manufacture of aviation gasoline, synthetic rubber, synthetic resins, toluene.

 Prepared Monthly by U. S. Industrial Chemicals, Inc.

U.S.I. CHEMICAL NEWS

December ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1943

Diethyl Oxalate Supplements Scarce Lacquer Solvents

Reagent Uses Also Afford Many Possibilities in Synthesis

Although in the past diethyl oxalate has found its greatest use in organic synthesis, it is today being employed in substantial quantities to replace and extend critically short nitrocellulose solvents.

Diethyl oxalate is an excellent solvent for nitrocellulose and has a slow evaporation rate. While its applications have previously been limited to specialized fields, due to its tendency to hydrolize, it is now being used very successfully where special care is taken to eliminate all possible water from the formulation. It is recommended that wherever possible diluents with high aromatic content be used inasmuch as diethyl oxalate has a much higher dilution ratio with aromatic hydrocarbon diluents than it has with petroleum naphthas.

Diethyl oxalate offers many possibilities in chemical synthesis. Here are a few typical examples:

1. With ethyl acetate in the presence of sodium ethoxide (sodium ethylate) it yields ethyl sodium oxalacetate.

2. With acetone in the presence of sodium ethoxide, it yields xanthochelidonic acid ester (acetone dioxalic ester) from which the ethyl ester of chelidonic acid may be obtained. Gamma-pyrone may in turn be obtained from this latter substance.

3. With zinc and alkyl iodides, it gives ethyl esters of dialkylglycolic acid.

4. With sodium amalgam, the alcoholate of ethyl glyoxylate, ethyl oxomalonate, ethyl racemate, and the ethyl ester of desoxalic acid may be obtained. From this latter acid there may be obtained by reacting with phenylhydrazine, the phenylhydrazone of ethyl glyoxylate.

5. Electrolytic reduction gives ethyl glyoxylate.

6. With sodium ethoxide and urea, it gives parabanic acid (oxalylurea).

7. It is used to manufacture phenobarbital.

8. With ortho-nitrotoluene there results an alcohol condensation product containing a third group in the benzene ring.

9. By distilling with an alcohol other than ethanol the oxalic ester of the alcohol may be obtained through alcoholysis.

Patents New Protective Treatment for Textiles

A Canadian Patent has been granted covering the use of trichlorobenzyl phenyl ether dissolved in alcohol or acetone as a mothproofing agent for textiles. It is mixed with salicylanilide as a fungicide or with pyrethrum as an insecticide.

New Anti-Rust Compound Is Announced by U.S.I.

Extensive Use in Automotive and Industrial Cooling Systems Seen for New Powder

Improved protection for radiators and other cooling-system surfaces is made possible by a new anti-rust compound in powder form, recently developed by U.S.I. Orange in color, the powder works equally well with water or any type of anti-freeze solution. Two ounces will protect a five-gallon capacity automobile cooling system.

Use of an inhibitor of this type in automobile cooling systems is particularly advisable this winter where anti-freeze solutions are being re-used, as the rust-inhibiting qualities originally present in the anti-freeze will have been lost.

Summer Use Important

In addition to imparting anti-corrosive properties to alcohol or permanent type anti-freeze solutions, the compound is recommended for use for summer radiator protection. Recent reports by government agencies and automotive engineering groups indicate that radiator corrosion is at its peak during the summer, due to the higher temperatures and the fact that ordinary water is so generally used as a coolant.

Protects Many Metals

Extensive tests in U.S.I. laboratories have shown that the new inhibitor will protect surfaces of a wide range of metals, including aluminum, steel, cast iron, copper, brass and solder. By keeping heat transfer surfaces clean, the product helps assure efficient cooling, thus preventing engine overheating and loss of anti-freeze from boil-over.

U.S.I.'s new compound has no effect on rubber, and therefore cannot cause trouble with radiator hoses or other rubber appliances in the cooling system. It is also entirely odorless.

Tests Possible Solvents For Tung Oil Extraction

Renewed interest in the possibility of increasing the yield of tung oil from domestic fruits is reflected in a recent study of solvents which might be used in an extraction process. Out of a total of 33 solvents studied, ethyl acetate and some 10 others held the most promise, from the standpoints of quality and yield of tung oil produced and from that of economics.

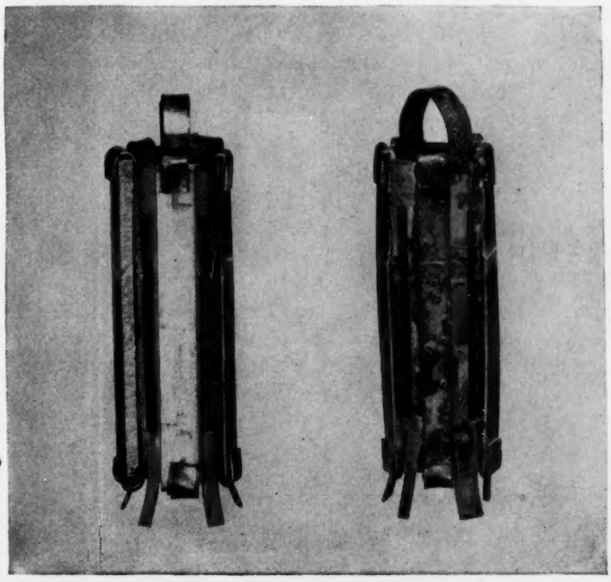
The study, carried on by three Department of Agriculture scientists, points out the necessity of selecting a solvent of sufficiently high boiling point to avoid excessive vapor losses, yet low enough to prevent deterioration of the tung oil quality through exposure to unduly high temperatures.

Alkyd Resin Can Replace Phenolics in Navy Primer

The Navy Department has announced that it will now accept, tentatively, a primer based on Holabird Specification ES-680a, Class 101 for use on all Naval equipment and machinery. This is covered by Specification 52-P-26 Primer, Metal (Brown) dated June 1, 1943, and will replace the original Zinc Chromate Primer 52-P-18 (phenolic) which will be used only for the painting of ships' hulls and com-

(Continued on next page)

Unretouched photo of test bundles just as they appeared after an accelerated corrosion test simulating the most severe conditions encountered in automotive radiators. Bundles consist of strips of copper, aluminum, solder, brass, and cast iron, all crimped with good electrical contact to a steel frame. Note the corrosion and severe electrolysis which has taken place on the "control" bundle at right, which was exposed to untreated tap water. Note how clean and free from electrolysis the bundle at left is after exposure to similar tap water which had been protected with U.S.I.'s new anti-rust compound.



December ★ **U.S.I. CHEMICAL NEWS** ★ 1943

Resins in Navy Primer

(Continued from preceding page)

partments. Until such time as the Navy can evaluate submitted samples of Specification 52-P-26 and can establish an approved list, those products now having the approval of Holabird Quartermasters Depot will be accepted by them.

Specification 52-P-26 is met completely by Aroplaz 1323-D, a product of U.S.I.'s Stroock & Wittenberg Division, which is already being used extensively in Holabird Specification ES-680a. Although this is one of the lowest priced pure alkyd resins, it is a versatile high-quality product.

Recovery of Free Acid From Pickling Liquors

Acetone has been found superior to solvents previously tried for promoting the crystallization of copperas from pickling liquor. While acetone is not satisfactory for the treatment of continuous-process liquor, batch liquor responds well from the standpoints of ferrous sulfate removal, acid concentration, quality of copperas, and acetone separation.

Reports New Remedy For Skin Ailments

Tetraethylthiuram monosulfide is reported by a British Journal to have proved effective in the treatment of scabies. The liquid preparation used was an emulsifiable oil having the composition:

Tetraethylthiuram monosulfide	25%
Polyglycerol ricinoleate	10%
Industrial methylated alcohol	65%

One part of this oil was added to four parts of water immediately before use.

Influence of Alcohols On Indicators Described

Color change of some titration indicators is reported to be markedly influenced by the lower alcohols.

The change is least pronounced with ethyl and *n*-propyl alcohol, more so with methyl, and most pronounced with iso-propyl alcohol. Impurities in the alcohol also have an appreciable effect, impossible values being obtained in the presence of ethers.

Method for Determining Chlorophyll and Carotene

Of significance to the dehydrated food and other industries is a recently announced method of determining chlorophyll, pheophytin, xanthophyll and carotene — key factors in the taste and nutritional "goodness" of vegetables.

The method involves a combination chromatographic, solvents-partition, and spectrophotometric techniques. Pigment is first extracted with acetone, then transferred to ether and subjected to direct spectrophotometric analysis for chlorophyll and henophytin. Xanthophyll and carotene are subsequently determined by chromatographic analysis.

Molasses Extender

Demand for Special Liquid Curbay as an extender for molasses in hog and dairy feed manufacture continues to grow. This U.S.I. product is also finding increased industrial use as a binder, and is said to offer interesting possibilities in the preparation of specialty agricultural products for plants and soils.

Special Liquid Curbay contains approximately 40-45% solids, can be handled just like molasses in storage or mixing equipment, and is available in tank car quantities without allocation limitations.

Determination of Water In High-Proof Ethanol

A mixture of anhydrous ethanol and bicyclohexyl exhibits a critical solution temperature of 23.4°C.; with 1 per cent of water present, this temperature becomes 41.4°, and with 2 per cent water 54.1°. Thus the critical solution temperature can be plotted against the percentage of water present and the resulting curve used for determining the water content of high-proof alcohol.

The procedure recommended is to add 4.0 ml. of bicyclohexyl to 2.0 ml. of the alcohol to be tested and stir with a dry thermometer. Heat until the solution becomes clear and then cool slowly with stirring. Note the temperature at which the mixture becomes slightly opalescent.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Two new fatty acids, azelaic and pelargonic, described as straight chain acids containing nine carbon atoms are announced. Now in commercial production, these acids suggest new fields for investigation in textile applications, modifications of resins, plasticizers, etc. **(No. 749)**

U S I

A paint brush cleaner is offered which the maker claims will swell the bristles and loosen dried paint in 12 to 96 hours. The liquid is non-inflammable, non-fuming and harmless to the hands. It can be re-used after straining. **(No. 750)**

U S I

Low freezing points and mild odors are the featured points of a new series of plasticizers and softeners now being offered for use in coatings, adhesives, plastics, synthetic resins and rubbers, etc. A chart of the physical properties of these new products is available from the maker. **(No. 751)**

U S I

A quick-setting, tacky adhesive, developed primarily to cement cork inserts in reconditioned or new crowns, is reported to work especially well in automatic cork inserting machines. The maker states the product is odorless and non-toxic. **(No. 752)**

U S I

Preventing electrolysis and consequent boiler corrosion is the purpose of a new galvanic cell designed to hang from a tube in the boiler. The cell, it is stated, concentrates electrolytic action at its negative pole, precipitating the mineral matter for removal during blowdown. **(No. 753)**

U S I

A new plasticizer, claimed to impart striking low temperature flexibility to synthetic rubber products, is being offered to processors of Butaprene, Chemigum, Hycar, Neoprene, Perbunan and Thiokol. **(No. 754)**

U S I

A new floor cleaner, recommended also as an oil and grease absorbent for reducing fire and slipping hazards, is announced. Said to be non-abrasive, odorless, and non-injurious to skin, clothing or flooring, the product will absorb up to 50% of its weight of oil or grease. **(No. 755)**

U S I

Stable, uniform oil emulsions are said to be produced at higher speed with the aid of a new group of soluble resinates. Sodium and potassium salts of selected resins, these resinates are useful in the manufacture of cutting oils, polishes, paints, and many other products. **(No. 756)**

U S I

A new gas mask, approved for use in the presence of acid gases, organic vapors, ammonia, carbon monoxide and toxic smokes, where sufficient oxygen is present to support life, is announced. Shatter-proof lenses, an arrangement to prevent lens-fogging, and a dial which indicates safe remaining service time are incorporated in the design. **(No. 757)**

U S I

A new paint remover is reported to cut through the toughest film, leaving a clean, neutral surface that requires no after-washing or neutralizing. The product is said to be waxless, involve a minimum of fire and toxic hazards. **(No. 758)**

U.S. INDUSTRIAL CHEMICALS, INC.

CHEMICALS · SOLVENTS · RESINS · ALCOHOLS · ANTI-FREEZE · USI SERVICE TO INDUSTRY

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ALCOHOLS
- Amyl Alcohol
- Butanol (Normal Butyl Alcohol)
- Fusel Oil—Refined

Ethanol (Ethyl Alcohol)
- Specially Denatured—all regular and anhydrous formulas
- Completely Denatured—all regular and anhydrous formulas
- Pure—190 proof, C.P. 96%, Absolute
- *Super Pyro Anti-freeze
- *Solox Proprietary Solvent

***ANSOLS**
- Ansol M
- Ansol PR

ACETIC ESTERS
- Amyl Acetate
- Butyl Acetate
- Ethyl Acetate

OXALIC ESTERS
- Dibutyl Oxalate
- Diethyl Oxalate

PHTHALIC ESTERS
- Diamyl Phthalate
- Dibutyl Phthalate
- Diethyl Phthalate

OTHER ESTERS
- *Diatol
- Diethyl Carbonate
- Ethyl Chloroformate
- Ethyl Formate

INTERMEDIATES
- Acetoacetanilide
- Acetoacet-ortho-anisidide
- Acetoacet-ortho-chloranilide
- Acetoacet-ortho-toluidide
- Acetoacet-para-chloranilide
- Ethyl Acetoacetate
- Ethyl Benzoylacetate
- Ethyl Sodium Oxalacetate

ETHERS
- Ethyl Ether
- Ethyl Ether Absolute—A.C.S.

RESINS
- Natural
- Synthetic

ACETONE
- Chemically Pure

FEED CONCENTRATES
- *Curbay B-G
- Curbay Special Liquid
- Vacatone 40

OTHER PRODUCTS
- Collodions
- Ethylene
- Ethylene Glycol
- Indalône
- Nitrocellulose Solutions
- Urethan

*Registered Trade Mark

BOOKLETS & CATALOGS

Chemicals

A589. Chemicals. Quarterly wholesale price list available. Heyden Chemical Corp.

A590. Chemicals Price List. Medicinal, analytic, technical, and photographic price listings are made in a new booklet now available. Merck and Co., Inc.

A591. M. R. in Buna-S. Summarizing the results of extensive tests, a report has been issued on the effects of M. R. or hard asphalt on the physical properties of GR-S obtained in a typical tire tread stock formula. The variety of combinations of properties in GR-S products made possible by varying the proportions of M. R., channel black and sulfur, with results of tests given in tabular and graphic form are shown. Wishnick-Tumpeer, Inc.

A592. Occupational Dermatitis. A description of a skin protective against irritant oils and solvents in particular is discussed in a folder which includes information on other industrial protectives also available for preventing finger marks on polished metals, protection against water-content irritants, and removal of duplicating ink stains. Prack Laboratories, Inc.

A593. Protective Coatings. Charts of the properties and explanations of the use of Lewisol Maleates in lacquer coatings and varnishes are found in a new booklet. Hercules Powder Co.

A594. Staybelite Esters. A booklet prepared for war producers gives latest data on esters from hydrogenated rosin (Staybelite) which is finding its widest use in formulation of adhesives based on rubber, ethyl cellulose, polybutene, chlorinated rubber, and nitrocellulose. Data on physical properties and lists of typical materials compatible with Staybelite esters, including various film-formers, resins, plasticizers, waxes, and asphalt, and laboratory formulations for rubber base adhesives, lacquers, and modified urea-formaldehyde resins are given. Hercules Powder Co.

A595. Super Fuel. 100 octane gasoline is discussed concisely in a 4-page folder. Notes on recent research on quinine substitutes, spectrographic analysis of "residuals" in the open hearth steel process, plastic bullets, plywood fabrication, and insecticides are included. Foster D. Snell, Inc.

A596. Synthetic Rubber. A company producing butadiene synthetic rubbers has prepared a glossary of pronunciations and descriptions of some of the difficult but popularly used terms in the synthetic rubber business. Hycar Chemical Co.

A597. Wartime Working Conditions. The minimum standards for maximum production are outlined in Special Bulletin No. 13 of the U. S. Department of Labor with instructions on safety, health, hours of work, and sanitation. It includes a selected bibliography of related material and a safety appraisal form for management. U. S. Department of Labor.

Equipment-Containers

F7. All-Electric Floatless Liquid Level Controls are featured in a catalog describing not only the primary equipment for the installation of these controls, but also special controls and panels, A. C. automatic starter and relay combinations, selector switches, special relays, waterproof enclosures, and wiring diagrams covering 12 of the most popular type of installations. B. W. Controller Corp.

F8. All-Metal Flexible Hose. Titeflex tubing used especially for conveying flammable liquids, illuminating gas, and in oil burner service is discussed in a new booklet with explanations and diagrams of every flexible connection application. The Titeflex Metal Hose Co.

F9. Check Charts for Stokers designed to make regular and thorough inspection easy are now available together with operating maintenance hints for efficient operation and minimum outage for single-retort and multiple-retort stokers. Westinghouse Electric and Manufacturing Co.

F10. Dust Control. An attractive, informative booklet discusses the menace of industrial dust to production, precision machinery and workers and describes economical, efficient methods of controlling and removing dust at its source. The various types of American dust control equipment available for practically any type dust control problem are described. American Foundry Equipment Co.

F11. Dust and Fume Control. An illustrated folder discusses cutting operating costs by using recovery equipment for fly ash, carbon black, phosphate rock, and for cement kiln and copper converter gases, including a chart permitting quick determination of the dollars and cents value of recovery efficiency. Western Precipitation Corp.

F12. Electricity in the Chemical Field is the subject of an attractive new 40-page bulletin describing G-E equipment used for generating, transforming, and distributing power; for material handling; for processing in the electro-chemical and thermo-chemical fields; and for operation in dusty atmospheres and in hazardous locations. General Electric Co.

F13. Fabrication of Steel, Pure Metal, and Alloy Material. Photographs and concise explanations show the line of expert fabricating done at the Nooter Works, emphasizing their alloy fabrication and silver construction, in a recently issued 20-page booklet. Their special assemblies and shop services are described. John Nooter Boiler Works Co.

F14. Felt Facts is a new illustrated booklet telling of the manufacture and use of wool felt, particularly in its applications in engineering and mechanical fields as an alternate for rubber, cork, certain fabrics and plastics, and other priority materials. The Felt Association, Inc.

F15. "Job-Suited" Truck and Caster Catalog is an outstanding materials handling equipment catalog enabling anyone to pick exactly the right truck for the handling job he has in mind, with over 500 illustrations of trucks, superstructures, and casters. Thomas Truck and Caster Co.

F16. Laboratory Equipment. A catalog lists and illustrates necessary equipment for the modern laboratory with explanations, and charts of specifications, high-lighting water baths, dry heat sterilizers, bacteriological incubators, and electric drying ovens. The Electric Hotpack Co., Inc.

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CANADIAN REVIEW

by W. A. JORDAN

Chemicals Up Slightly

A slight gain in chemical production, exclusive of Government-owned plant output, was recorded in October, with the index up two points over the preceding month and three points over October 1942. Production of Government chemicals and explosives units reached peak level last December, and although total output so far this year has been 10 per cent over the corresponding period of 1942, some downward adjustments have been evident lately. It is estimated that employment in these enterprises is off 10 to 15 per cent from early this year.

W. A. Jordan

Overall industrial operations have been maintained at record levels throughout the year, but it is probable that slight modifications will develop in the next few months. Further major expansion of manufacturing facilities is not to be expected.

An important development of chemical significance has been the Government's action in declaring the pulp and paper industry "essential," with a consequent upgrading of its manpower priority rating. This ruling enhances the possibility of recruiting the 20,000 additional woodsmen required to maintain the operations of this leading chemical consumer.

Official advise indicates that the supply position of phthalic anhydride, dibutylphthalate and glycerine is slated to ease while supplies of caustic soda, soda ash, mineral acids, and alcohol are reasonably adequate.

Fertilizer Nitrates to U. S.

Canadian producers have solved the problem of caking of ammonium nitrate by two methods, namely by concentration of the nitrate to about 98 per cent and subsequent granulation in a shot tower, and by employment of a special adaptation of a rosin-wax coating procedure.

As a result the Dominion's nitrogenous fertilizer position is well in hand, and some 150,000 tons of nitrate will be exported to the U. S. A. next year from three units formerly devoted exclusively to explosive requirements.

A recent order of the Fertilizer Administrator lifts restrictions in force since last December on the use of nitrogenous fertilizers for other than essential farm purposes.

Despite the better supply position in this respect, however, it is anticipated officially that further restrictions may be drafted to curtail the use of potash fertilizers.

Disposal of Gov't Plants

A year ago the chemical industry was engrossed in production worries and was little concerned with postwar problems; today, with output still close to capacity tonnage, the supply emergency has definitely passed, and considerable realistic thinking is being done as to the future.

In particular, the chemicals and explosives industry has mushroomed spectacularly since 1939, perhaps top heavily relative to peacetime standards, and Government investment in such plants is now of the order of the total capital employed by prewar chemical producers. The policy to be followed in regard to the disposition of this Crown investment poses a nice problem.

Constructive, down-to-earth surveys of general industry have been conducted by industrial groups such as the Canadian Manufacturers' Association in an effort to evaluate postwar markets. Recently, it was announced that Ottawa will shortly establish a Ministry of Reconstruction and create a Crown company for the peacetime liquidation of Government holdings and for the disposition of obsolete and surplus war materials. This company will probably not be fully empowered until the House meets late in January.

Although no clear-cut, basic policy has yet been made public it is intimated that as far as the chemical industry is concerned such existing facilities as are of peacetime value will be transferred to private ownership upon the cessation of hostilities. The industry is eagerly awaiting official, detailed advice, so that plans for the future can be prepared accordingly.

Acetylene Black Provides Conductor in Bonding Resin

A rather unique use for acetylene black has been devised in Canada recently in connection with a new process for the production of resin-bonded laminates.

In this process, acetylene black is added to the adhesive resin to render it electrically conductive. The resin mixture is made a part of an electrical circuit, and the resistance heat so generated sets the resin.

The method is particularly applicable to the fabrication of large laminated bodies, with a minimum of equipment necessary and substantial time savings realized.

Societies to Merge

Members of the committee appointed by the Canadian Chemical Association, Canadian Institute of Chemistry, and Society of Chemical Industry, to appraise plans for the amalgamation of the three organizations, have unanimously approved a report recommending this consolidation and outlining a proposed constitution for the body so formed.

The committee's recommendations are to be placed before the executives of the three societies late this month, and if endorsed, as is probable, amalgamation will be effected early in the new year.

Synthetic Butanol Comes In

The first synthetic butanol plant to operate in Canada came into production recently and at present is operating some 30 per cent above its rated capacity of 3,000,000 pounds of butanol per annum. A fermentation process butanol unit functioned in Canada a few years ago, but not on a major scale.

This new plant, financed by the Department of Munitions and Supply, but operated under contract by private interests, is located in Quebec and utilizes low cost, abundant raw materials drawn from the electrochemical heart of the province.

Production capacity is more than adequate to accommodate all Government and industrial needs of the Dominion, and some butanol exports will be made to the U. S., if required, but mainly to the United Kingdom where the butanol supply situation has been somewhat more stringent than on this continent.

Engineering Joint Conference

Another step in the direction of closer active cooperation between technical people in the United States and Canada was taken this month when Robert M. Gates, president of the American Society of Mechanical Engineers, and Kenneth M. Cameron, president of the Engineering Institute of Canada, signed a permanent joint-conference agreement between the two professional bodies.

The pact calls for joint meetings, close collaboration of technical committees on special subjects, and consideration of joint research projects. International cooperation of engineers and scientists in wartime has worked so well that it would seem to warrant carrying the tie-up into the peace period.

NEWS OF THE MONTH

Synthetic Organic Production-Sales Up

U. S. Tariff Commission reports increase of 28 percent in 1942 over 1941. Coal tar medicinals show largest increase of special groups.

A REPORT of the preliminary statistics of commercial production and sales of synthetic organic chemicals in 1942 in the United States, released by the U. S. Tariff Commission, shows an increase of 29 per cent over 1941 sales, which were then the highest on record, and of 177 per cent over the average value of sales annually in the period 1936-1940. The value of sales of all synthetic organic chemicals amounted to 932 million dollars in 1942. Of the special groups included in the report: coal-tar dyes, crudes, and intermediates; coal-tar and non-coal-tar medicinals; flavors and perfume materials, and resins, rubber chemicals, and miscellaneous chemicals, the group showing the largest increase over 1941 was that of the coal-tar medicinals whose sales increased 60 per cent in value and 29 per cent in quantity.

A breakdown of production and sales shows a sharp increase for most groups, although in certain categories there were decreases. United States coke-oven operations in 1942 resulted in an increase in output of coal-tar from 704 million gallons in 1941 to 740 million in 1942, a rise of 5 per cent. Total reported tar production, including tar from coal-gas retort plants but excluding water-gas and oil-gas tar, amounted to 761 million gallons in 1942. In the same period the total quantity of tar distilled by purchasers increased from 387 million to 446 million gallons. The total quantity of coal tar distilled and topped by producers and refiners amounted to 640 million gallons in 1942 as compared with 571 gallons in 1941.

The production and sales of coal-tar crudes were much higher in 1942 than in 1941. The output of benzene was 90 per cent higher; of toluene (ordnance plants excluded), 22 per cent; of naphthalene, 27 per cent; and of creosote oil, 16 per cent. Motor benzene production decreased 39 per cent, largely because of the necessity of increasing benzene production.

The combined output of intermediate and finished coal-tar products amounted to 2 billion pounds, compared with 1.8 billion in 1941, and the production of non-coal-tar synthetics increased from 5 billion to 7 billion pounds. Production and sales of coal-tar dyes, flavors, and perfumes, resins, rubber chemicals, and color lakes and toners were less in 1942 than in 1941.

Output of coal-tar resins decreased from 334 million pounds in 1941 to 284 million in 1942 chiefly because of a decline in the output of phthalic anhydride resins (used in paints, varnishes, and lacquers) and of resins derived from phenol for uses other than casting and molding. In 1942, production of non-coal-tar resins rose about 38 per cent, although maleic anhydride resin production decreased about 18 per cent. The production of other principal non-coal-tar resins, polyvinyl, terpene, and petroleum resins, increased markedly in 1942.

The total dye output in 1942 amounted to 152 million pounds (17 million pounds less than the peak output of 1941). The principal dyes produced, in descending order of importance, were vat, direct, sulfur, and acid dyes, accounting for about 78 per cent of the total dye production.

The reduced consumption of rubber in the United States in 1942 is reflected in the output of rubber chemicals, which declined by 8 million pounds from the output of 59.7 million pounds in 1941. Production and sales of both coal-tar and non-coal-tar medicinals amounted to about 39 million pounds which was 18 per cent greater than that of 1941. The principal increases were in sulfa drugs and vitamins.

The average unit value of sales of most coal-tar products was higher than that of the previous year, but that of rubber chemicals, intermediates, lakes, and toners decreased slightly. Among the non-coal-tar chemicals, the unit value of sales of perfume materials decreased sharply. There was a rise in the average unit value of all finished coal-tar products from 45 cents per pound in 1941 to 49 cents in 1942. No change occurred in the average unit value of non-coal-tar chemicals in the same period.

48-Hour Week Extended

The 48-hour week will be in effect by the end of the year in a majority of the 193 labor shortage areas according to a recent announcement by Chairman Paul V. McNutt of the War Manpower Commission. Among these areas, it was explained, are 69 in which acute shortages have actually developed. They are classified as Group I. The remainder, classified as Group II, are those in which it is anticipated "acute" shortages will develop within six months.

Mandatory application of the 48-hour week in Group I areas was recently provided for in a W.M.C. instruction to field offices. Reports received from regional directors indicate that by the end of the year a large proportion of the 124 areas in Group II will also be on a 48-hour week. Nineteen of the Group II areas were on the 48-hour list when the instructions were issued in October. To these have been added 20 in which the longer week is in effect and regional reports make it appear likely that almost all will be working the longer week by January 1.

MacLeod Named to WFA

The appointment of Dr. G. F. MacLeod as chief of the Chemicals Division virtually completed reorganization of the Chemicals and Fertilizers Branch of the War Food Administration which has been underway since July 1 for the purpose of handling chemical problems of the farm program more efficiently. This branch was made a part of the Office of Materials and Facilities of the War

To Receive TAPPI Medal

The 1944 medal of the Technical Association of the Pulp and Paper Industry will be presented to David Clark Everest, president and general manager of the Marathon Paper Mills Company in recognition of his outstanding contributions to the pulp and paper industry.

Food Administration at the beginning of the current fiscal year.

P. H. Groggins is still chief of the branch in the new organization responsible directly to J. W. Millard, chief of the Office of Materials and Facilities. The reorganization has divided the branch into two main divisions and five sections, each having a particular function in handling the problems of chemicals and fertilizers. The two divisions are the Chemicals Division and the Fertilizers Division, the former headed by the recently appointed Dr. MacLeod and the latter by M. J. Derrick who previously was with the Indiana Farm Bureau.

Under the Chemicals Division are the Economic Poisons Orders Section, with C. C. Hamilton as chief; the Economic Poisons Requirements Section, headed by Dr. MacLeod temporarily; and the Miscellaneous Chemicals Section, under the direction of J. M. Schaffer. The Fertilizers Division has two sections: the Fertilizers Orders Section, headed by W. E. Lakin, and the Fertilizers Requirements Section, with W. F. Watkins as chief. The Field Services Section is under the direction of L. G. Porter who reports directly to Mr. Groggins in the new set-up.

New A.S.T.M. Committee on Industrial Aromatics

At an organization meeting of the new A.S.T.M. Committee D-16 on Industrial Aromatic Hydrocarbons held in New York on October 26, the personnel of the group was approved and temporary officers were selected. Products covered by the committee would include various grades of benzene, toluene, xylene, solvent naphthas and other light oil products.

Temporary chairman of the committee is J. M. Weiss, consulting chemical engineer. The temporary secretary is R. P. Anderson, secretary, Division of Refining, American Petroleum Institute. C. A. Lunn, process engineer, Consolidated Edison Co., is vice chairman. These officers will serve until June, 1944, when the committee will select permanent officers.

The following subcommittees are being organized with officers as indicated. Subcommittee:

I Methods of Test of Crude Aromatic Products, C. A. Lunn, chairman; D. F. Gould, vice chairman.

II Methods of Test of Refined Aromatic Products, V. J. Altieri, chairman; E. T. Scafe, vice chairman.

III Specifications for Aromatic Chemicals, J. N. Wickert, chairman; Wesley Minnis, vice chairman.

IV Specifications for Aromatic Solvents, R. E. Ruthruff, chairman; L. A. Wetlaufer, vice chairman.

CALENDAR OF EVENTS

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS (Winter Technical Meeting), Engineering Societies Building, New York, N. Y., Jan. 24-28.
AMERICAN MANAGEMENT ASSOCIATION (Marketing Conference), Waldorf-Astoria Hotel, New York, N. Y., Jan. 12-13.
AMERICAN MANAGEMENT ASSOCIATION (Personnel Conference), Palmer House, Chicago, Ill., Feb. 9-11.
PUBLIC UTILITIES SALES EXECUTIVES' CONFERENCE, Netherland Plaza Hotel, Cincinnati, O., Jan. 25-26.

Foreign Cartels in Hormone Industry

Assistant Attorney General Wendell Berge told Congress Dec. 9 that removal of German strangleholds from the synthetic hormone industry in the United States may lead to significant developments in the treatment of soldiers suffering from shock.

Testifying before a Senate Military Affairs subcommittee studying mobilization, Mr. Berge said that a German-dominated world cartel, with U. S. firms participating until American entry in the war, had helped keep from the public the full benefits of scientific discoveries in the field of the vital body fluids. He urged steps to free the field from cartel arrangements.

He said the largest American cartel partner, the Schering Corp. of Bloomfield, N. J., was established and dominated by the huge chemical trust of Berlin, Schering A.G. After the outbreak of the war in 1939, the American firm took over Schering A.G.'s markets in South America, enabling the parent firm to evade the British blockade and blacklist of enemy firms and helping spread German propaganda throughout the Continent, Mr. Berge testified.

The chief of the Justice Department's antitrust division said the cartel was composed of five powerful European companies, with Schering A. G. dominant. The others were Chemical Industry, of Basle, Switzerland; N. J. Organon, of Oss, Holland; C. F. Boehringer & Sons, of Mannheib, Germany; and Chimio, of France. Each of the first four had an affiliate in this country.

Mr. Berge said the Department of Justice prosecuted the four American firms in 1941 for anti-trust violations, and the concerns pleaded nolo contendere and paid fines totaling $54,000.

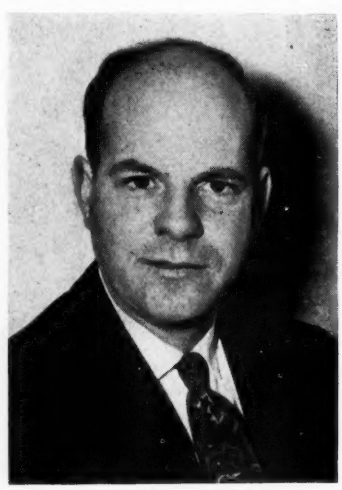
Sugar Research Begins

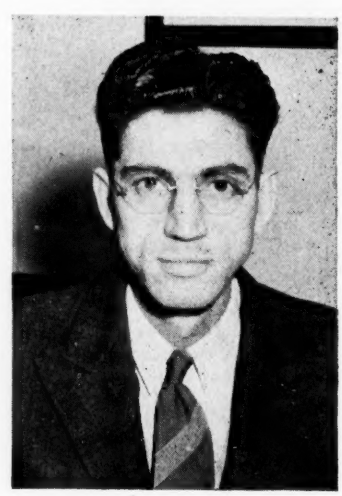
A long-range program of research on sugar, will be undertaken at the Massachusetts Institute of Technology in cooperation with the newly established Sugar Research Foundation of New York.

Plans for the project, which are expected to lead to new and industrially important uses for both sugar and its numerous relatives of the carbohydrate family, were made public in a joint announcement by Dr. Karl T. Compton, president of the institute, and Joseph F. Abbott, president of Sugar Research Foundation, which has made a grant of $125,000 for a five-year program of research.

The foundation was created for the development of fundamental knowledge in the field of carbohydrate chemistry, biochemistry, and nutrition. Membership is

Drackett Company Names New Executive Personnel





Formerly director of soybean research for the Ford Motor Co., Robert A. Boyer, left, has joined the staff of the Drackett Company as director of scientific research. Mr. Boyer has brought with him a major part of the laboratory and plant equipment that he and his staff developed at Dearborn; they will continue their work with soybeans. Among other personnel changes Donald Spice, right, has been advanced from senior chemist to the post of chemical director of Drackett's laboratories.

open to all producers and processors of sugar in this country, Puerto Rico, Hawaii and Cuba.

Appoint Peroxygen Advisory Committee

The War Production Board has announced the formation of the Peroxygen Chemicals Industry Advisory Committee.

Government presiding officer: Morris R. Stanley. Committee members are: C. A. Buerk, Buffalo Electrochemical Co.; Louis Neuberg, Westvaco Chlorine Products Corp.; Fred Prince, Pennsylvania Salt Mfg. Co.; C. W. Tucker, E. I. du Pont de Nemours & Co., Inc.; F. Visser 'T Hooft, Lucidol Corp. The first meeting was held on November 16, 1943.

A.S.T.M. Issues Standards

Recent publications of the A.S.T.M. include three which are of special value to chemical industries and a fourth which is of interest to chemical suppliers. The three books of standards in the chemical field include Standards on Petroleum Products and Lubricants, a revised edition of Standards on Plastics, and Standards on the Chemical Analysis of Metals. The fourth is the new Standards on Steel Piping Materials.

In petroleum product standards extensive changes were made during 1943 covering standards on knock characteristics of aviation and motor fuels, and viscosity temperature charts. The plastics standards include over 25 new specifications and tests which have been standardized in 1943 with particular emphasis on purchase specifications. The important new feature of the publication on the chemical analysis of metals is the tentative recommended practice for apparatus and reagents for chemical analysis of metals. The Standards on Steel Piping Materials includes specifications on forgings and welding fittings, bolting material, and, for the first time, one covering heat-treated carbon steel.

These publications can be purchased from A.S.T.M. Headquarters, 260 S. Broad Street, Philadelphia, Pa.

Heads Science Academy

Dr. Duncan A. MacInnes, physical chemist and member of the Rockefeller Institute for Medical Research, was elected president of the New York Academy of Sciences, one of the leading scientific organizations in the United States, at the 126th annual meeting of the Academy December 15. Dr. MacInnes is a past president of the American Electrochemical Society and a member of American Chemical Society.

Six renowned scientists, including Professor Alexander Fleming of the University of London and the Royal College of Surgeons, discoverer of penicillin, were

elected honorary life members. Among them were two Nobel Prize winners, Sir Frederick Gowland Hopkins of the University of Cambridge, and Professor The Svedberg, head of the Physical Chemistry Institute, University of Upsala, Sweden.

Honor Quartz Blowers

A first honor award to the master quartz blowers of the United States for "their incalculable service to chemistry" was presented Dec. 6 by Dr. Hugh S. Taylor, Professor of Chemistry at Princeton University, to George Kennel, foreman of the quartz blowing department at Hanovia Chemical and Manufacturing Co., representing the quartz craftsmen, at the Nineteenth Exposition of Chemical Idustries.

Fischelis Gets Medal

The Remington Medal, highest award in American pharmacy, was presented to Dr. Robert P. Fischelis, internationally known pharmaceutical chemist of Trenton, N. J., at a dinner given by the New York Branch of the American Pharmaceutical Association, Dec. 7.

The medalist is now chief of the Chemicals, Drugs and Health Supplies Branch of the Office of Civilian Requirements, WPB. He is president of the New Jersey Pharmaceutical Association and secretary of the Board of Pharmacy of the State of New Jersey.

Rubber Output Increases

The synthetic rubber industry in the United States will produce 45,000 long tons of rubber this month, or nearly a third of the entire output of the Government synthetic rubber plants so far, but production will be raised to capacity of 70,000 tons a month by the end of 1944, Col. Bradley Dewey, Federal Rubber Director, declared December 8.

The administrator spoke to 2,000 persons at the sixth biennial award dinner for achievement in chemical engineering in the Hotel Waldorf-Astoria. The awards went to eighty-three companies whose aid to the American synthetic rubber industry were adjudged by a committee of fifty-three as the outstanding contribution this year to chemical engineering. The dinner was sponsored by *Chemical and Metallurgical Engineering.*

WPB Development Unit Shifted to Paper Division

War Production Board announced Dec. 6 that its war products development section, formerly a part of the agency's pulp and paper division, has been designated the technical staff and assigned to the paper division under Rex W. Hovey, director. Administratively it is set up on a parallel with the assigned staff, including Army, Navy and legal representatives, and the joint Forest Products Bureau staff, composed of the distribution, labor and transportation sections, and will report directly to the division director.

Chemical Output Gains

For the first time in recent years, detailed figures on production of a group of selected chemicals were made public Nov. 22 by the War Production Board's chemical division. Today's list is to be expanded as conditions in the future permit, officials said.

"In August, 1943," the report stated, "the production of these chemicals shows in general considerable increase over the corresponding month of 1942. For example, the production of chlorine in August, 1943, was 133,650 tons, compared with 114,499 tons in August, 1942. This represented an increase of about 17%. Electrolytic caustic soda, with an output of 105,246 tons in August, represents an increase of 33% compared with August, 1942."

Production of lime soda caustic last August totaled 81,941 tons, according to the report, a gain of 65%, compared with the corresponding month last year.

Among the organic chemicals included in the report was phenol with a reported production of 15,196,644 pounds for August, a gain of 33% compared with August, 1942. Phthalic anhydride was up 26% compared with a year ago with an output of 9,566,720 pounds. Other organic chemicals showing substantial increases included formaldehyde, isopropyl alcohol, acetone and normal butyl alcohol. Aniline production decreased compared with August a year ago.

Monsanto Publicity Director

J. Handly Wright has been appointed director of the Department of Industrial and Public Relations of Monsanto Chemical Company. In his new position he will have charge of advertising, public relations, industrial and labor relations, safety program and company publications.

To Increase Domestic Production of Potash

Expanded facilities are expected to increase the production of muriate of potash by approximately 80,000 tons in the 1944-45 season, it was reported at the December meeting of the Potash Producers Industry Advisory Committee, but the anticipated domestic output still is somewhat less than the requirements stated by the War Food Administration for fertilizer use. Domestic production for 1944-45 in terms of potassium oxide is estimated at 760,000 tons, of which some 80-85 per cent is used in agriculture.

No increase in available supplies can be expected from imports, it was pointed out at the meeting, because European producers not under Axis domination will need their entire supply for local use. It was agreed that no additional general allocation of potash can be made in Period 2—June 1, 1943 to March 31, 1944. The committee also recommended that the present potash allocation order remain in effect.

Cartel Pact Charged

Describing its move as another step in the drive against the cartel system, the Department of Justice has filed in Federal Court a civil complaint charging Merck & Co., Inc., of Rahway, N. J., and E. Merck Chemical Works of Darmstadt, Germany, with violation of the anti-trust laws.

The complaint, which described the American company as the largest producer of pharmaceutical chemicals in the United States, said a cartel agreement between the two concerns covered approximately 400 pharmaceuticals and chemicals, including quinines, sulfa drugs, vitamins, narcotics and mercurials.

Film on Stainless Steel

A new motion picture has been released by the Bureau of Mines titled, "STAINLESS STEEL." Produced in cooperation with the Allegheny Ludlum Steel Corp., this film graphically traces the production process of Allegheny Metal.

The motion picture is suited for use by industrial and civil defense training classes, training classes conducted by the armed forces, and for schools, colleges, churches, civic and business organizations.

Applications for free short-term loans of "STAINLESS STEEL," should be addressed to Graphic Services Section, Bureau of Mines, 4800 Forbes Street, Pittsburgh, 13, Pa., and should state specifically that the borrower has a sound projector for 16 millimeter film. Although

"Africa"
"Adventure in the Pacific"
"Bali"
"Amid Alaskan Snows"
"Aleutian Islands"

"The pilots were quiet and solemn that night"...

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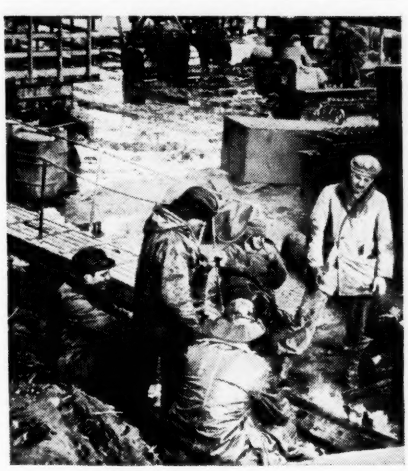

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Tri-Sure News

NUMBER 12 ★ 30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK ★ DECEMBER, 1943

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THIS is a picture of American boys — thousands of miles from America. It is a picture of boys who will work and fight to transform the lonely Pacific island on which they have landed into another bastion of security for millions of American homes.

The prayers and pledges of a united people are with them. And all about them, in eloquent evidence that these pledges will be kept, are the finest weapons a grateful nation can forge, and drums of good American gasoline to speed planes and tanks to victory.

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no charge is made for use of the film, the exhibitor is expected to pay transportation charges both ways and for loss or damage other than normal wear.

COMPANIES

Dorr Increases Facilities

An extension to the Westport Mill, research and testing laboratories of the Dorr Company, is being completed. According to the announcement it will increase the number of research laboratories and will provide an additional wet laboratory for specialized work. The principal new accession is the Semiworks, in which has been provided an open area with floors at various levels, headroom and a flexible design for handling material and equipment with ease.

Powder Plant to Shut

The Hercules Powder Company announced Dec. 8 that it would suspend production at the Belvidere plant of its subsidiary, the New Jersey Powder Company, as soon as supplies of raw material for smokeless powder are exhausted, having completed a contract with the British Ministry of Supplies.

St. Regis Expands

The manufacture of specification kraft paper in greater quantities largely for conversion into multiwall paper bags for shipment of foodstuffs, chemicals and construction materials to maintain civilian economy at home and for the support of armed forces and Allied civilian populations abroad, is announced by Roy K. Ferguson, president of St. Regis Paper Co.

An additional 100,000 tons of pulp will be made available annually as a result of the re-opening of a new Tacoma mill which will be under the direction of Walter DeLong, vice-president of St. Regis Paper Co. Translated into bag production this would supply sturdy shipping sacks to package upwards of nine million tons of flour, feed, sugar, salt, fertilizer, chemicals, cement, lime and other commodities for domestic and export shipment.

The acquisition of new timber rights, the recent construction of a bag plant in Kansas City and the increased use of new protective papers are all steps taken by the company toward solving the nationwide paper shortage, particularly in the field of paper containers.

Sulfur Plant Starts

Purification of coke oven gas to protect manufacturing equipment has been started by the Ford Motor Co., and in the same operation another product, sulfur, is added to a list of those already extracted by the company in coal coke gas processing.

Company officials announced that the Ford sulfur plant is now in operation and extracting approximately six tons of 99% pure sulfur daily. More than a year was required for construction of the plant.

The new equipment, built by the Koppers Co. of Pittsburgh, extracts sulfur by the ammonia thylox method. Despite the fact that it is one of the largest of its kind in the world, two skilled men can operate the plant at peak production.

Atlas Opens Lab.

Establishment of a central research laboratory near Wilmington, Del., by Atlas Powder Company has been announced by K. R. Brown, director of research for Atlas. Dr. R. S. Rose, Jr., present director of the Atlas research laboratory facilities at Reynolds, Pa., will be director of the new central laboratory, the first unit of which is nearing completion.

Fundamentally, the research to be conducted at the new laboratory lies in the development of organic compounds for an untold number of industrial applications. The research which has been carried on at the present laboratories at Reynolds has led toward the development of many new industrial materials including sorbitol and mannitol and materials made from them, which are used for emulsifiers, plasticizers,

resins, insecticides, and softeners in a hundred different industries.

"Cat" Cracker Completed

A new fluid catalytic cracking unit for the production of war gasoline was recently dedicated at Baltimore. The new plant, the sixth of its kind to be completed by the Standard Oil Company (N. J.), completes a $14,000,000 modernization program at one of the country's oldest refineries, which has been in operation for sixty-six years.

The new plant known as the "Baltimore Giant," is the very latest type and has incorporated in it many improvements resulting from the earlier experience of Standard Oil of New Jersey with its big fluid cracking units at Bayway, N. J., Baytown, Tex., and Baton Rouge, La. While output figures are a military secret, it is stated that production will run into thousands of barrels daily.

Fairmount Moves

Fairmount Chemical Co., Inc., has announced the removal of its sales offices to 136 Liberty Street, New York 6.

Staynew Changes Name

Staynew Filter Corp. of Rochester, N. Y., will henceforth be known as Dollinger Corp., taking this name from Lewis L. Dollinger, president and founder of the company. Recently expanded manufacturing facilities have made possible the development of new products, other than filters, which are soon to be announced. The Staynew and Protectomotor trademarks will continue to be used in connection with all filter products.

There is no change whatever in the management, financial organization, or general policies of the company.

Increases Facilities

Industrial Raw Materials Corp. recently moved to larger offices at 400 Madison Avenue, N. Y. 22.

Changes Address

The Manufacturers Charcoal Co., the Wood Distillers Corp., and the Wood Chemical Institute announce that they are now located at East Smethport, Pa.

Tannin Factory Opened

The Argentine Consulate recently announced that the Sociedad Anonima Exportadora de Productos Tanicos (Tannin Products Export Corporation) had begun business in the United States, dealing chiefly in Quebracho extract, used in tanning leather.

The announcement said the company had bought a factory in Newark to process the bark from which the extract is obtained. Organization of the company, capitalized at the equivalent of $1,250,000, was an aftermath of anti-trust proceedings earlier this year against a British concern, Forestal Company, which through subsidiaries controlled a large part of Argentine production and sold in the American market.

Calco Chemical Advances Executives

Robert Collyer, left, has been appointed to the post of advertising manager of the Calco Chemical Division of American Cyanamid Company. Mr. Collyer will supervise advertising and promotion activities of the division. Former head of the company's Aniline, Rubber Accelerator, and Beta Naphthol Plants at Bound Brook, Morton Starr Cressy, Jr., right, has been promoted to the position of sales representative in the Chemicals and Intermediates Department of the division.

Wayne Acquires Hooker Library

The Kresge Foundation has granted to Wayne University the sum of $100,000 for the establishment of a scientific library. Together with an equal amount contributed by interested organizations and individuals, the grant will be used to purchase and modernize the well known Hooker Scientific Library, now located at Central College, Fayette, Mo. At Wayne the collection will be known as the Kresge-Hooker Scientific Library.

Complete Big Cl Plant

Announcement was made recently of the completion of the largest chlorine plant ever built in a single unit east of the Mississippi River by the Columbia Chemical Division of the Pittsburgh Plate Glass Co., operator, and the H. K. Ferguson Co., industrial engineers and builders. The plant is located at Natrium, W. Va., in a section noted for its natural resources. It was financed by the Defense Plant Corp. In addition to manufacturing liquid chlorine the plant produces caustic soda as a co-product.

Consultant Opens Office

Wilburn F. Bernstein, formerly chief chemical engineer of Victor Mfg. & Gasket Co., has announced the opening of consultant engineering offices at 1 North La Salle, Chicago 2, Ill.

The following companies have recently been awarded the Army-Navy "E" for excellence in production of war materials.

Atlas Powder Co., Paducah, Ky.

S. Blickman, Inc., Weehawken, N. J.

B. F. Goodrich Co., American Anode, Inc., Akron, Ohio.

Imperial Paper and Color Corp., Pigment Color-Chemical Div., Glens Falls, N. Y.

International Minerals & Chemical Corp., Magnesium Div., Chicago, Ill.

The Hewitt Rubber Corp., Buffalo, N. Y.

I. F. Laucks, Inc., Seattle, Washington-Star added to flag.

A. R. Maas Chemical Co., Southgate, Calif.

Merck & Co., Inc., Rahway, N. J.; East Falls Plant, Philadelphia, Pa.; Stonewall Plant, Elkton, Va.

Nubian Paint and Varnish Co., Chicago, Ill.

Pacific Coast Borax Co., Wilmington, Calif.

Southern Alkali Corp., Corpus Christi, Tex.

E. R. Squibb & Son, Brooklyn, N. Y. Second star added to flag.

Whiting Corp., Harvey, Ill. Star added to flag.

ASSOCIATIONS

SOCMA Discusses Patents

Dexter North of the Alien Property Custodian presented the official side of the policies and practices of the APC with respect to vested alien patents which were again the major topic of discussion this year at the annual meeting of the Synthetic Organic Chemical Manufacturers Association. He emphasized that the purpose of patents' seizure is to benefit the people of the United States and that exclusive licensing is likely to suppress use and improvement. However, departure from non-exclusive policy to one of reasonable royalty and exclusive use might be effected, Mr. North said, if large investment for proper development is necessary and if sharing development costs and benefits is desirable under a process.

Thomas W. Delahanty, acting chief of the Chemical Division of the Bureau of Foreign and Domestic Commerce, reported that governmental agencies are easing up their objections to disseminating industrial statistical data, although army and navy department orders still hold back foreign trade data.

The roster of the currently functioning executive body reads as follows: President, August Merz, of the Calco Chemical Division, American Cyanamid Co., first vice-president, E. H. Killheffer, of E. I. du Pont de Nemours & Co.; second vice-president, V. E. Williams, of the Monsanto Chemical Co.; treasurer, R. E. Dorland, of The Dow Chemical Co.; and secretary, C. A. Mace of New York.

Pharmacists Hear Fleming, Berge

The American Pharmaceutical Manufacturers Association bestowed its 1941 annual scientific award upon Dr. Alexander Fleming of London, discoverer of penicillin.

The presentation took place during the two-day conference of the association that opened Dec. 13 at the Hotel Waldorf-Astoria. Maj. Gen. Norman T. Kirk, Surgeon General of the Army, made the presentation in a transatlantic broadcast, and Dr. Fleming delivered his acceptance address over the air from London.

In a principal address to the group, Wendell Berge, assistant attorney general of the United States, said that the nation faced its greatest peril in achieving full production or full employment in the post-war period in the "divide and rule" strategy of private economic government in the form of cartels.

Following close upon Vice President Wallace's attack on international monopolies in vital medicines, Mr. Berge told approximately 150 manufacturers that the significance of cartels to the American economy has been demonstrated time and again since the outbreak of war in the list of shortages of vital materials resulting from cartel restrictions.

He explained how cartels have handicapped our trade relations with Latin America.

Whether the restriction stems from efforts of a cartel to confine American industry to the domestic market, or to strangle research and production by American concerns, or to use patents to impose unlawful restraints on trade in the drug industry, it must be our determined purpose to restore free enterprise in the pharmaceutical field, he concluded.

Schwarz Names Laufer

Dr. Stephen Laufer, who has been associated with the Schwarz Laboratories, Inc., for the past 14 years, has been elected assistant vice-president of the corporation. In that capacity, he will be in charge of brewery technology.

New Committee Organized for Paint, Varnish Clubs

A "Material and Manufacturing Committee" of the Federation of Paint and Varnish Production Clubs was recently formed. The primary purpose of this group will be to survey and study the current trends and future progress in those matters pertaining to the production side of the paint industry, and to serve as a source of general information on new developments to members of the federation.

The scope will include consideration of developments of raw materials which are now or will become available after the war; the improvement in products to meet probable industrial and trade demands for finishing the new materials of construction, fabrication and design; and the review of new processing equipment and methods applicable to the manufacture of paint, varnish, lacquer and allied materials.

Personnel of the committee includes Chairman, V. C. Bidlack, McCloskey Varnish Co.; P. O. Blackmore, Interchemical Corp.; C. W. Clark, E. I. Du Pont de Nemours & Co.; R. B. Frazier American Lacquer Solvents Co.; E. L. Gott, Gilman Paint & Varnish Co.; A. Pahl, W. P. Fuller & Co.; F. G. Schleicher, W. D. Wilson Printing Ink Co.; H. H. Shuger, Baltimore Paint & Color Works, Inc.; C. M. Skinner, Sherwin-Williams Co. of Canada, Ltd; H. N. Stevens, Monsanto Chemical Co.; H. M. Wilcox, Ferbert-Schorndorfer Co.; F. C. Atwood, Atlantic Research Associates. Ex-officio, J. J. Mattiello, Hilo Varnish Corp.

SOCMA Changes Headquarters

The office of the Synthetic Organic Chemical Association has changed its location to 6 East 45th Street, New York 17, N. Y. Their new phone numbers are now MUrray Hill 2-8128-9.

Council of Laboratories Elects Officers

Announcement was made of the election of the following officers for 1944 at the annual meeting of the American Council of Commercial Laboratories, held in Chicago, Illinois, on December 13-14:

Heads Rubber Research

Clarence B. Moore has been appointed head of the rubber division of Thermoid Research Laboratories. Mr. Moore was formerly with the Goodyear Tire and Rubber Company.

President: W. P. Putnam, president and technical director of The Detroit Testing Laboratory.

Vice-President: H. L. Sherman, treasurer of Skinner and Sherman, Inc.

Treasurer: T. A. Wright, president and general manager of Lucius Pitkin, Inc.

Secretary: B. L. Oser, vice-president and director of Food Research Laboratories, Inc.

In addition to the above, the following constitute the executive committee for 1944: A. R. Ellis, president of Pittsburgh Testing Laboratory; D. E. Douty, president of United States Testing Company, Inc.; R. W. Truesdail, president of Truesdail Laboratories, Inc.; J. H. Herron, president of The James H. Herron Co.; A. C. Purdy, partner of Bull and Roberts.

The American Council of Commercial Laboratories also announced the publication of its directory describing the activities and specialties of the individual members of the association. This "Guide to the Leading Independent Testing, Research and Inspection Laboratories of America" contains a comprehensive tabulation of the various services in all major fields of scientific and technical investigations as applied to materials, structures, machinery and equipment entering into civilian use and the requirements of the military and naval establishments of the United States and its Allies.

A copy of the directory may be obtained upon application to the Executive Secretary, A. J. Nydick, 63 Wall Street, N. Y. 5, N. Y.

PERSONNEL

Sullivan Resigns

F. W. Sullivan, Jr., has resigned as technical director of the Institute of Gas Technology. He is now located at The Chemists' Club and will be associated with Hydrocarbon Research, Inc.

New Vice-President

William E. Phillips, formerly with Mathieson Alkali Works, was recently appointed vice-president of Merchants Chemical Company.

Upjohn Advances Officers

Executive changes in The Upjohn Company which are to become effective the first of the year will bring Donald S. Gilmore to the presidency, a position occupied by Dr. L. N. Upjohn since 1930. Dr. Upjohn will assume the chairmanship of the board of directors, maintaining his active connection and his general supervision of the company's affairs.

Among the other changes, Dr. E. Gifford Upjohn, who has been with the company since 1931 and is now medical director, will retain his present duties as medical director in the post of vice-president. Dr. Harold E. Adams, who joined the company in 1926 and has been general superintendent, is vice-president and director of production. The third man elevated to a vice-presidency is C. V. Patterson, a general sales manager. Mr. Patterson, also placed on the board of directors, now assumes the office of director of sales.

Pittsburgh Glass Executive Changes

At a recent meeting of the board of directors of the Pittsburgh Plate Glass Company the following changes in executive personnel were approved. Clarence M. Brown has resigned as chairman of the board of directors, but will remain active as chairman of the finance committee. Harry S. Wherrett, now vice-chairman, will become chairman of the board. Robert L. Clause, now president, will become vice-chairman of the board and Harry B. Higgins, now executive vice-president, will become president.

THOMAS M. RECTOR has been elected vice-president in charge of research and development for General Foods Corp. Mr. Rector was made manager of research and development for the company last May.

DR. WILLIAM DOERING, formerly of Harvard University, is now a member of the staff of the Department of Chemistry, Columbia University, as instructor in chemistry.

DR. ROSLYN T. ROTH, until recently biochemist at New York Psychiatric Institute, has been added to the staff of Food Research Labs., Inc.

HARRY J. STURM has been appointed to the Administrative Department staff of Quaker Chemical Products Corp.

CHARLES D. YOUNG, formerly employed as an assistant in the Department of Chemistry of Ohio State University, has joined the research staff of Battelle Memorial Institute and is assigned to its division of non-ferrous metallurgy.

ARTHUR SMITH, JR., of the Magnesium Division of The Dow Chemical Co., has been named head of magnesium sales for the southwest territory with headquarters in Dow's St. Louis, Mo., office.

HAROLD R. HAY has joined the sales development staff of the Philadelphia Quartz Co. Prior to his present position

he was with the U. S. Dept. of Agriculture, Northern Regional Lab., Peoria, Ill.

OBITUARIES

DR. HAROLD STANARD ADAMS, vice-president, plant manager and a director of the Upjohn Co., died on December 5 of a heart attack at his home in Kalamazoo, Mich. He was 57 years old. Dr. Adams once taught chemistry at Massachusetts State College.

CLINTON L. BATEHOLTS, president of the Specialty Insulation Mfg. Co. and chairman of the board of the Colasta Co. died on December 5. His age was 63. Mr. Bateholts, a pioneer in his field, had been engaged in the development of plastics for forty-five years, starting with the General Electric Co.

PROF. GEORGE H. BURROWS of Burlington, Vt., who retired in 1942 as head of the chemistry department of the University of Vermont after thirty years on its faculty, died November 22, at Safety Harbor, Fla., after a brief illness.

GRAFTON DUVAL DORSEY, 82, a former director of the National Lead Co., died December 8, in his apartment at the Hotel Weylin, after a long illness.

SUE CLEVELAND HAMILTON, secretary-treasurer of the New England Association of Chemistry Teachers and a staff member of the Garland School faculty for the last ten years, died in the Peter Bent Brigham Hospital on December 6.

ROBERT DUNN HOWERTON, Chicago manager of the Calco Chemical Co., died at Chicago, Ill., December 5, at the age of 42. Mr. Howerton who lived in Winnetka, had been associated with the chemical company for ten years.

MRS. ADELINE DESALE LINK, assistant professor of chemistry at the University of Chicago, considered one of America's outstanding women chemists, died November 21 at Chicago, Ill. She was 51 years old.

DR. GEORGINE M. LUDEN, physician and pathologist, formerly an associate of the Mayo Brothers at Rochester, Minn., died on November 20. She was with the Mayo Clinic from 1914 to 1929 specializing in blood chemistry.

HARRY M. PIERCE, a director of the du Pont Co. and retired president and chief engineer of the du Pont Engineering Co. died November 23 in the Jefferson Hospital, Philadelphia. His age was 70.

NEWS OF SUPPLIERS

AMERICAN CAR AND FOUNDRY CO. has announced the following appointments: Victor R. Willoughby, vice president, director of research and development; E. D. Campbell, vice president in charge of engineering; Alvin A. Borgading, vice president in charge of purchases; William L. Stancliff, vice president in charge of sales; J. A. Scheckenbach and R. A. Williams, vice presidents.

Begins Protein Research

Formerly research instructor at the University of Chicago, Dr. Lucile Hac has joined the staff of the Research Division of International Minerals & Chemical Corp. She will be engaged in protein research in International's new laboratory at its Amino Plant.

A. G. Wood has been named district sales manager of the company's Washington, D. C., sales offices. Dudley L. O'Brien, former sales agent at the Cleveland office, has been appointed district sales manager of this office, succeeding R. A. Williams who was transferred to the N. Y. general offices.

PITTSBURGH EQUITABLE METER COMPANY-MERCO NORDSTROM VALVE CO. has opened new offices in Atlanta, Ga. C. C. Moore, who has been in charge of the

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Government Publications

The following free publications are available for limited distribution by the Office of Minerals Reports, U. S. Bureau of Mines, Washington, D. C.

MANGANESE INVESTIGATIONS: 20. ORE-DRESSING STUDIES OF EASTERN MANGANESE ORES. One of a series of reports of an extensive test program to determine methods of recovering a ferromanganese-grade product from domestic deposits of manganese and manganiferous iron ores. R. I. 3684 by W. A. Calhoun, T. L. Johnston, M. M. Fine, and S. M. Shelton.

WORK OF THE SAFETY DIVISION, FISCAL YEAR 1942. R. I. 3698.

THE BURNING RATE OF NATURAL GRAPHITE. To set up specifications for graphite, the burning rate or oxidation of this material was chosen as one of its more important properties. Report records the burning rates of Madagascar, Ceylon, and four domestic graphites. R. I. 3692 by Glen Dale Coe.

COMPARATIVE YIELDS OF LIGHT OIL, TAR AND CONSTITUENTS FROM CARBONIZATION TESTS AT 800°, 900°, and 1,000° C. R. I. 3695 by C. R. Holmes, J. E. Wilson, and J. D. Davis.

PREVENTION OF BUTADIENE-AIR EXPLOSIONS BY ADDITION OF NITROGEN AND CARBON DIOXIDE. Gives results of experiments to establish limits of inflammability of butadiene-air mixtures to which various proportions of nitrogen and carbon dioxide were added. R. I. 3691 by G. W. Jones and R. E. Kennedy.

STRUCTURAL FEATURES OF TYPICAL AMERICAN COMMERCIAL DETONATORS. Describes the structural features of selected typical fuse and electric detonators that have appeared in the field in recent years. Presents a general picture of the more important types, details of their make-up, and a brief discussion of the explosive charges used. R. I. 3696 by R. L. Grant.

EFFECTS OF SHEATHS ON GASEOUS PRODUCTS FROM PERMISSIBLE EXPLOSIVES. Presents tests showing the effects of sheaths on the production of toxic gases as well as other effects of general and technical interest, including data that should be useful in analyzing the course of explosive reactions. R. I. 3705 by E. J. Murphy, A. P. Rowles, and J. C. Holtz with A. R. T. Denues. Bureau of Mines.

SOME TOOLS AND METHODS USED IN CLEANING OIL WELLS IN CALIFORNIA. R. I. 3706 by G. B. Shea. Bureau of Mines.

DETERMINATION OF TUNGSTEN IN LOW-GRADE ORES. Contains two methods of analysis that employ cinchonine and a third that does not require cinchonine. R. I. 3709 by H. E. Peterson and W. L. Anderson. Bureau of Mines.

ANILINE POINTS OF HYDROCARBONS. R. I. 3721, by J. S. Ball. Report based upon extensive compilation of literature covering aniline points and critical solution temperatures in aniline of pure hydrocarbons. Best values of both properties selected for those hydrocarbons for which sufficient data are available. Relationship between aniline point and molecular structure has been developed.

INFLAMMABILITY AND EXPLOSIBILITY OF METAL POWDERS. R. I. 3722, by I. Hartmann, J. Nagy, and H. R. Brown. Information on methods of providing protection against hazards inherent in the production and handling of powdered metals necessitated by increased amounts of powdered metals produced for munitions and rapidly growing industry of powder metallurgy.

EFFECT OF ACIDS AND ALKALIES UPON CARBONIZATION PRODUCTS OF COAL. R. I. 3726, by R. E. Brewer. Report of effect upon different coals of acids and alkalies used in various concentrations either in aqueous or dry state, at different temperatures and pressures, and in presence or absence of air.

INFLAMMABILITY OF METHYLENE CHLORIDE-OXYGEN-NITROGEN MIXTURES. R. I. 3727, by G. Jones, R. Kennedy, and F. Scott. Results of tests carried out with various mixtures of methylene chloride, oxygen, and nitrogen mixtures to find inflammable range of methylene chloride in pure oxygen and in air enriched with oxygen.

SELECTION, USE AND MAINTENANCE OF RESPIRATORY PROTECTIVE DEVICES. I. C. 7236 by H. H. Schrenk and S. J. Pearce.

DANGER FROM CARBON MONOXIDE IN THE HOME. I. C. 7238 by L. B. Berger and H. H. Schrenk.

ANNUAL REPORT OF RESEARCH AND TECHNOLOGIC WORK ON COAL. Fiscal Year 1942. Brief summary of progress of investigations conducted by Bureau of Mines. I. C. 7241 by A. C. Fieldner and W. F. Rice.

ECONOMIC CONSIDERATIONS IN THE RECOVERY OF MAGNESIA FROM DOLOMITE. I. C. 7247, by A. Schallis. A comprehensive review of the uses of dolomite as a most economical abundant source of magnesia for magnesium metal.

SUMMARY OF THE STATE LAWS PERTAINING TO EXPLOSIVES included in five information circulars each covering a number of States and roughly corresponding to one or more of the eight districts into which the United States has been divided for purposes of administration of work by the Bureau's Health and Safety Service. The information circulars and states and districts covered are as follows: I. C. 7251, District B (excluding eastern Pennsylvania): Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont. I. C. 7252, Districts A and C (including eastern Pennsylvania from district B

and western Kentucky from district E): Kentucky, Maryland, Pennsylvania, Ohio, Virginia, West Virginia. I. C. 7253, Districts E and F. (including western Nebraska and western South Dakota from district H and excluding western Kentucky): Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin. I. C. 7254, Districts D and G: Alabama, Arkansas, Florida, Georgia, Kansas, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas. I. C. 7255, District H (excluding western Nebraska and western South Dakota): Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

Other Publications

A.S.T.M. Standards on Petroleum Products and Lubricants. The 1943 sixteenth edition of this compilation gives in their latest form some 80 standardized specifications, tests, and definitions. New items included for the first time are a test for oil content of paraffin wax (D 721), the emergency method of test for color of U. S. Army motor fuel (ES 32), two proposed tests published for information and comment covering saponification number of petroleum products by electrometric titration and a test for oxidation characteristics of steam turbine oils. Extensive changes were made during 1943 in these standards: Knock characteristics of aviation and motor fuels, viscosity temperature charts, and others affected by minor modifications. Price $2.25.

A.S.T.M. Standards on Plastics. This, the October, 1943 edition, is the second edition of this compilation, the first having been issued in June, 1943. It includes over 25 new specifications and tests which have been standardized during 1943 with particular emphasis on purchase specifications. Eighteen specifications covering numerous types of molding compounds and other plastics in the form of sheets, tubes and rods, etc., including sheets and tubes for radio applications, are provided. There are four standards on nonrigid plastics, of which the largest group provides methods of tests covering such subjects as colorfastness to light, flammability, hardness, haze, mar resistance, punching quality, stiffness, tensile properties, tear resistance, and thermal expansion. Price $2.00.

A.S.T.M. Standards on Steel Piping Materials. Forty-four standards and 25 emergency alternate provisions issued to expedite procurement are included in the 1943 edition of this compilation. Many of the specifications and emergency provisions are part of schedules appended to WPB limitation order L211. There are 10 specifications on boiler, superheater, and miscellaneous tubes. Various types of pipe, still tubes for refinery service and heat-exchanger and condenser tubes, and specifications widely used in the field of carbon alloy steel castings for valves, flanges, and fittings are covered. Four specifications on forgings and welding fittings are given, and of the four standards for bolting material, one is included for the first time covering heat-treated carbon steel. The book provides the austenite grain size classification chart for steels. Price $1.75.

Copies of A.S.T.M. publications can be obtained in heavy paper cover from A.S.T.M. Headquarters, 260 S. Broad St., Philadelphia 2, Pa.

Water Supply and Treatment. Many revisions in the text matter, addition of much new material, substitution of more modern illustrations and drawings, and introduction of several color plates make the new fifth edition of "Water Supply and Treatment" published as Bulletin 211 of the National Lime Ass'n., an important one. The discussion of water supplies and methods by which water is treated to make it more useful and better adapted to human and industrial requirements is brief but in sufficient detail to be of practical value to city officials, civic organizations, and industrialists who may be contemplating the treatment and softening of water. The text would be a useful reference to plant operators, engineers, students and the layman who is interested in problems of water procurement and treatment. Data on all processes is presented without particular emphasis on value of lime treatment. This booklet is available for 75c from the National Lime Ass'n., Washington, D. C.

National Fire Codes for Flammable Liquids, Gases, Chemicals and Explosives, 1943. The National Fire Protection Association offers this volume at a time when the war is demanding enormous quantities of those materials whose fire and explosive hazards are fought with great danger to human life and property. The book brings together the many standards dealing with these hazards. It supercedes the National Fire Codes for Flammable Liquids and Gases, Edition of 1938.

The volume is divided into nine parts as follows: Flammable Liquid Storage and Handling; Oil and Gasoline Burning Equipment; Liquified Petroleum Gases; Utilization of Flammable Liquids; Gases; Refrigeration and Fumigation; Explosive and Nitrocellulose Materials; Tables of Properties—Hazardous Chemicals, Flammable Liquids; Flash Point Tests. The several codes are in the form of suggested ordinances, standards or recommended good practice requirements universally recognized and used as the authoritative guides to best practice. This 504 page book can be secured for $3.00 from the National Fire Protection Association, 66 Batterymarch Street, Boston, Massachusetts.

12-TG-8

CHEMICAL SPECIALTIES NEWS

Adhesives Council Chosen

Ten officials of firms manufacturing starch and other vegetable adhesive products have been appointed by the Office of Price Administration to serve on a Starch Adhesive Industry Advisory Committee.

Those named to the committee are: Frank Greenwall, president, National Starch Products Co.; Edwin Stein, vice-president, Stein-Hall Manufacturing Co.; A. B. Crowell, vice-president, Union Paste Co.; J. B. B. Stryker, president, Perkins Glue Co.; H. C. Loderhouse, president, United Paste and Glue Co.; William Weaver, president, Arabol Manufacturing Co.; George J. Muller, vice-president, Paisley Products, Inc.; Allan Lawrence, secretary, Manhattan Paste & Glue Co.; E. R. Paul, vice-president, Swift and Co.; Edwin H. Arnold, president, Arnold-Hoffman Co., Inc.

Merkin Elects Official

Ralph H. Everett has been elected executive vice-president and becomes general manager of M. J. Merkin Paint Company. Mr. Everett has been an executive of the Keystone Varnish Co., and was one of the founders and a former president of the New York Paint and Varnish Production Club, as well as a past president of the Federation of Paint and Varnish Production Clubs.

Elected Vice-President

Neil H. McElroy was elected to the board of directors of the Procter & Gamble Company at the annual stockholders' meeting held in Cincinnati on October 14 and was subsequently elected to the office of vice-president in charge of advertising and promotion.

Lyons with Devoe & Raynolds

Appointed to fill the newly-created position of administrative manager of laboratories for Devoe & Raynolds Co., Inc., Henry N. Lyons will follow through the lines of research which are instituted at the company's laboratories in Louisville. During the past twenty-one years, Mr. Lyons was associated with the Cities Service Co. in various capacities.

Insecticide Group Named

An Agricultural Insecticide and Fungicide Industry Advisory Committee, consisting of executives of 22 manufacturing firms representing various parts of the United States, was recently appointed by the Office of Price Administration. The committee will consult with OPA on pricing and sales matters affecting the agricultural insecticide industry as a whole.

Personnel of the new committee is as follows: W. Leonard Bartlum, president, Florida-Agricultural Supply Co.; W. C. Bennett, president, Phelps-Dodge Refining Corp.; J. H. Boyd, executive vice-president, Commercial Chemical Co.; J. B. Cary, president, Niagara Sprayer & Chemical Co.; Leon David, president, Brooklyn Chemical Works, Inc.; H. C. Davies, president, California Spray-Chemical Corp.; R. E. Demmon, vice-president, Stauffer Chemical Co.; W. S. Gavan, sales manager, American Cyanamid & Chemical Corp.; Harold R. King, vice-president, R. J. Prentiss and Co., Inc.; G. F. Leonard, vice-president, Tobacco By-Products & Chemical Corp.; T. H. McCormack, assistant sales director, Grasselli Chemicals Division, E. I. du Pont de Nemours & Co., Inc.

Roy E. Miller, president, Miller Products Co.; D. F. Murphy, sales manager, Rohm & Haas Co.; Harold Noble, manager of the Insecticide Division, S. B. Penick and Co.; O. M. Poole, president, Derris, Inc.; Fred S. Porter, sales manager, Tennessee Corp.; Fred C. Shaneman, vice-president, Pennsylvania Salt Mfg. Co.; M. L. Somerville, plant superintendent, The Sherwin-Williams Co.; R. B. Stoddard, manager of the Insecticide Department, Dodge & Olcott; D. I. Trainer, director of the Technical Service, General Chemical Co.; B. P. Webster, vice-president, Chipman Chemical Co.; Alfred Weed, vice-president., John Powell and Co., Inc.

Howard Joins Nuodex

Harry W. Howard, formerly chief of the Aromatic Petroleum Solvents Unit, Chemicals Division, WPB, is now associated with and will represent Nuodex Products Co., Inc., in Washington, D. C.

Research Head Chosen

Dr. Irving Hochstadter, formerly president and technical director of the Hochstadter Laboratories, Inc., and of Still & Van Siclen, Inc., has been appointed research administrator to Gallowhur & Co.

By Any Other Name

Gesarol, new chlorinated diphenyl ethane whose insecticidal possibilities were reported in the August AIF News, is acquiring an assortment of names. According to Dr. R. C. Roark, in charge of insecticide investigations for the Bureau of Entomology and Plant Quarantine, it is commonly referred to as GNB, meaning Gesarol Neocid Base, when imported from Switzerland; as GNB-A when made in the United States; and British and American authorities now have decided to call it DDT—based on one of its chemical names; Dichloro diphenyltrichlorethane. Dr. Roark reports the material "already has shown remarkable toxicity against certain pests" and is soluble not only in kerosene but in alcohol and other organic solvents. While its insecticidal value was discovered only recently, he says, it was first prepared "about 70 years ago in one of the German universities."

Opens New Offices

Ronnie, Inc., chemical specialty company, has opened a New York office at 40 Wall Street, from where its export business will be handled.

WAR REGULATIONS SUMMARY

Acetic Acid—Acetic acid, acetic anhydride, and acetaldehyde permitted to be sold in quantities of 54 gallons or less per month per customer without specific authorization from WPB. Order M-243 amended.

Ascorbic Acid—Filing of suppliers' forms no longer required of exporters since suppliers' reports already give the required information. Small order exemption changed from 100 ounces to 3 kilograms. Order M-269 amended.

Butyl Alcohol—Price ceilings for butyl alcohol produced in United States territories and possessions increased by three cents per pound. Odder MPR 37, Amendment 11, effective December 10, 1943.

Butyl Alcohol, Acetate—A producer delivering for the account of another producer should use the second producers ceiling price. Order MPR 37, Amendment 12, effective December 10, 1943.

Dibutyl Sebacate—Sliding scale of prices established based on weighted average costs of butyl alcohol. MPR 37, Amendment 10.

Ethyl Alcohol—Purchasers permitted to acquire 7,900 gallons of ethyl alcohol in any calendar quarter without WPB authorization. Manufacturers of cosmetics and toiletries who did not use ethyl alcohol in the base period are permitted to obtain up to 162 gallons in any one quarter. Order M-30 amended.

Ethyl Alcohol—Sales of West Coast ethyl alcohol by Defense Supplies Corporation to government agencies now have the same exemption from price control as ethyl alcohol produced in other areas. MPR 295, Amendment 5, December 17, 1943.

Indian Kyanite—Allocation control of this product discontinued.

Insecticides—DDT, a substitute for pyrethrum, placed under allocation control, Order M-340 amended, December 10, 1943.

Naval Stores—To assure continued production of pine tar, pine tar oil, and pine wood charcoal, OPA has authorized producers to increase maximum prices generally 2¾ cents per gallon for sales of pine tar or pine tar oil and $5.00 per ton for sales of pine wood charcoal.

Phosphate Rock—Producer prices for Tennessee phosphate rock have been increased approximately 20 cents per ton to compensate mine operators for wage raises recently granted to employees.

Polypentaerythritol—Producers and consumers come under Order M-25, with producers required to file information on Form WPB-2946, while consumers must file reports on WPB-2945.

Pyrophyllite—A 40 cents per ton increase in maximum prices granted by OPA to compensate for production costs and permit maximum output of existing plants. Amendment 20, Order No. A-1 MPR 188, effective December 8, 1943.

Sodium Metal—Placed under allocation control. Small order exemption is 100 pounds or less in any one month from all suppliers. Applications for larger amounts must be filed with WPB Chemicals Division prior to the 10th of the month preceding month in which delivery is requested. Order M-357, November 16, 1943.

Sulfuric Acid—40 per cent oleum (109 sulfuric acid) sold to ordnance plants operated for or by the government will continue indefinitely to be exempt from price control. Amendment No. 36, Rev. Sup. Reg. 1, November 11, 1943.

Tanning Materials—Chestnut extract placed under complete allocation control by WPB effective January 1, 1944. Applications for supplies must be made on Form WPB-3357 on or before the fifth day of the month preceding that in which delivery is desired.

Titanium Dioxide—Preference ratings below AA-2 invalidated except on military orders. Non-military orders not bearing an AA-2 rating must be filled as non-rated orders to the extent that supplies are available. Order M-353, December 6, 1943.

Vegetable Oils—The following fats and oils, formerly imported only by a government procurement agency, may now be imported by private interests: castor and oiticica oils, cashew shell liquid (Brazil), sesame seed, tucum and muru muru kernels and oils, glycerine (Argentina and Canada), oleic acid, stearic acid, and corn oil. Importers must obtain exemption under WPB Order M-63 by filing applications on WPB form 1041, to import above commodities.

Vitamin A—Use of oils containing Vitamin A prohibited for enriching animal or poultry feeds beyond limits set in WPB Order L-40.

Zinc Dust—Amount of zinc dust that may be purchased without authorization has been increased by about 50 per cent, and the requirement that consumers must forward application certificates to the supplier for endorsement has been eliminated. Order M-11-1 amended.

Tire Production Tight

Fourth progress report of the Office of Rubber Director has been issued by Rubber Director Bradley Dewey. Although the tire situation remains tight, and will continue so for at least the next six to nine months, synthetic rubber production is in good shape stated the report.

Synthetic rubbers are now being produced in large quantity, and by early 1944 all plants in the synthetic program will be in operation. But availability of synthetic rubber does not immediately assure an adequate number of tires. The necessary production of tires requires plant facility expansions that will not be completed until well into 1944. Likewise, production capacity of high-tenacity rayon and cotton tire cords must be expanded. These, too, are under way, although the full program for rayon cord facilities will not come into operation for almost a year.

The goal which the Rubber Director has set for the rubber industry is a minimum of 30,000,000 synthetic tires in 1944. Buna S is still inferior to natural rubber in tubes, especially those used in tires with drop center rims. The best Buna S tube still tears too easily when hot, and is less resistant to abrasion than natural rubber; but it will give good mileage if mounted carefully and properly inflated. Present data indicate that another synthetic rubber, Butyl, will be used for tubes. Such tubes will be better than natural rubber from the standpoint of holding air and will resist heat and tearing exceptionally well. However, production of Butyl has been and still is small, and until the problem of increasing production has been solved, the burden will have to be carried by other rubbers.

Aluminum Plant Closed

The War Production Board reported Nov. 23 that a third new aluminum plant, that of the Phelps-Dodge Copper Production Corp. at Hammond, Ind., had been halted while still under construction. It is part of a general cutback in aluminum facilities.

MARKETS IN REVIEW

THE pace of chemical and all industrial production was maintained during November, and as a sufficiency state evidently is being attained by some phases of war production, government authorities are giving some thought to the relaxation of restrictions. The Federal Reserve Board's production index rose two points last month to 245 of the 1935-1939 average. It was 240 in July and 227 at the start of the year.

The War Production Board afforded an idea of the part chemicals are playing in the war effort when the Chemical Division showed last month that 1943 sales of the chemical industries under its supervision will amount to $6,000,000,000, a dollar volume which has substantially doubled since 1939 with relatively few increases in prices.

It was figured that some 80 per cent of that volume is reconsumed by the industry itself in the production of other chemicals or by the processing industries in turning out non-chemical products. For the manufacture of five vitamins 150 different chemicals are required; the sulfa drugs over 50, and atabrine or quinacrine, 38.

While industrial mobilization for war nears completion, manpower stands as the most formidable handicap to further expansion of production, chemicals included. Because of that factor it is estimated that 1944 output cannot be expanded more than 7 per cent over the 1943 third quarter rate. But the war is by no means over for industry, and in addition to heavy demands facing it next year the chemical industry must be prepared for sudden and unexpected shifts in demand.

The alcohol supply picture for 1944 has undergone a further change, and the raw materials outlook in some respects has deteriorated over the past month. At a recent meeting with the Distillers Industry Advisory Committee it was revealed that the WPB had lowered its 1944 requirements estimate from 640,000,000 to 625,000,000 gallons, of which some 250,000,000 gallons will be required for synthetic rubber against the previous reservation of 330,000,000 for this purpose. The WPB stockpile meanwhile has fallen from above 100,000,000 down to around 75,000,000 gallons.

While negotiations for the purchase of Cuban and Puerto Rican molasses and invert sugar are still hanging fire, industrial alcohol plants in the East are rapidly changing back to these materials while the beverage industry remains on grain. The Du Pont plant at Deepwater, N. J., is now entirely on molasses, while the Publicker Commercial Alcohol Co. at the start of December had two of its four plants working on that material. U. S. Industrial Chemicals had one unit entirely on molasses, another partly on molasses and partly on grain, while its New Orleans plant has remained all along on molasses. The New England Alcohol Co. (Monsanto) is working entirely on the sugar by-product.

The industrial distillers have been set down for alcohol production of 225,000,000 gallons during 1944, making some arrangement with the sugar producers imperative if the raw materials are to be assured for that production. Beverage distillers are to supply 240,000,000, and synthetic plants 75,000,000 gallons, the latter from ethylene via ethyl sulfate.

Synthetic fabric production on a large scale following the war is a possibility that promises to revolutionize textile processes and cause some important shifts in chemical consumption by that industry. The wool industry both here and abroad has shown some concern over this development, and so has the cotton industry here. As against the current price of $1 lb. or more for clothing wools, filament rayon for the wool trade costs 36c, and rayon staple fiber, 24c lb. Rayon staple fiber also appears a formidable competitor at that price for cotton goods, and its cost might be brought down further after the war.

Casein-type fibers are competing with wool in the manufacture of women's heavy clothing, and it is not reasonable to expect that producers of the synthetics will neglect an opportunity to expand production in the future. Natural silk will find that nylon and possibly vinyon, the latter a vinyl copolymer, have increased their advantages tremendously in postwar competition if and when the natural fiber is able to stage a comeback.

Dye and chemical manufacturers serving the upholstery fabrics industry have learned that production of these materials cannot be increased, and that the amount of civilian goods available during the first six months of 1944 will be smaller. One large manufacturer in this field has just opened his books after being withdrawn from the market for five months.

The war-developed rayon tire, which may find a large postwar outlet in the construction of automobile tires, is now undergoing significant expansion. One large rayon interest, American Viscose Corporation, has begun weaving rayon tire cloth for bomber tires, and the industry foresees widespread use of this material for civilian passenger tires in the future.

Paper and paperboard production for 1944 is placed by authorities in that industry at between 12,000,000 and 13,000,000 tons. This would represent a drop of some 4,000,000 tons from what the industry was able to turn out in each of the years 1942 and 1943, and it indicates that many uses for paper and paperboard next year will have to take a reduction. All efforts to boost production have run into difficulties, and pulpwood inventories and production have been steadily heading downward. Campaigns for the collection of waste paper have also been disappointing. Only increased cutting of wood pulp next year may be able to avert paper restrictions, but owing to the manpower dilemma in this industry the outlook is none too promising.

Heavy Chemicals. There were indications of an easier supply situation in some products. Acetic acid and some of the potash compounds were in a more relaxed market position. Production of copper sulfate has been well maintained and stocks were rising during November. Sodium sulfie also was in freer supply for a time, but firmed up later on tanning industry demands to $3.15 per 100 lbs. in the open market. The placing of new plant capacity in production apparently had no immediate affect upon chlorine or caustic soda, and the dealer prices for caustic ruled from $2.85 to $3 per 100.

Fertilizer materials were marked by the establishment of dollars and cents price ceilings on mixed goods, phosphate and potash, and the elimination of inequalities between various grades resulting from the previous practice of freezing individual grades. The War Food Administration was reported considering the release of additional tonnages of cotton-seed meal for fertilizer. The potash industry urged revision of Lend-Lease allocations for this vital chemical, asserting a 10 per cent deficit here threatened farm production. Allied successes in the Mediterranean meanwhile have opened potash sources in Palestine, Spain, Russia. Ammonium sulfate production at by-product coke plants for the first 10 months, 635,563 short tons, compared with 640,086 for the same period in 1942.

Fine Chemicals. It was reported at the start of November that glycerin

supplies had increased to the point where they were equal to a five-month supply. Stocks in hands of consumers and refiners were between 70,000,000 and 75,000,000 lbs. Allocations of refined glycerin accordingly were liberalized for many industrial users. Drug and pharmaceutical manufacturers continue to face a shortage in menthol, a former Far Eastern import. Brazilian industry said to be capable of meeting all United States menthol requirements, thus far has only been able to supply a trickle. With the domestic supply of peppermint oil frozen, the possibility of obtaining menthol from that source appears remote. Ascorbic acid (Vitamin C) was given a further price reduction by producers to $30 per kilo, down $1.75. Smaller packages scale up to $32.47 per kilo for 500-gram bottle. As in the instance of thiamin hydrochloride (B^1) and Riboflavin (B^2) price reductions for bulk vitamin C result from expanded production and lower costs. Dealers who formerly exported citric acid report that under new arrangements the requirements of British India, Africa and other markets will be supplied by Great Britain. Supplies of quicksilver are reported more ample and prices somewhat easier. In an effort to forestall allocations, the WPB Chemicals Division issued a December directive to producers of the bleaching materials hydrogen peroxide and sodium perborate, leaving to them the task of filling essential uses from current insufficient production.

Coal Tar Chemicals. The phenol situation came into sharper focus last month as production from the newer synthetic plants caught up with domestic and Lend-Lease demands. Cresylic acid also was in better supply, while the benzol-toluol-xylol group remained one of the wartime scarcities. Imports of British cresylic have been sufficiently regular as to allow the accumulation of ample stocks. More benzol is entering ethylbenzene processes for synthetic rubber, is still employed in quantity for high-test fuels. The involved price relationship in these chemicals was not rendered easier when OPA placed cents per gallon ceilings on coal tar for 56 plants, ranging from 3¼c to 7¼ per gallon, f.o.b. producer's plant.

Paint Materials. While the materials situation has eased in some respects, this industry is still unable to obtain shellac, and is still seeking to obtain larger supplies of drying oils. The industry has submitted an appeal for unrestricted use of linseed oil to the Food Distribution Administration. In view of current large production of the oil, paint manufacturers feel that the order should at least be liberalized. Sales of titanium oxides at this time are said to represent 100 per cent of production and moving against rated orders. Shellac supplies in hands of the Defense Supplies Corporation continue to mount, and use of the natural resin is still restricted to direct and indirect military applications. Carbon Black, chrome and other chemical colors, all remain in active demand.

To Expand Butylenes and Isobutane Production

Petroleum Administration for War has called upon refiners and natural gasoline manufacturers to increase the quantity of butylenes and isobutane to be made available for use in meeting constantly expanding war needs.

Action was taken by issuing PAW Directive 75, which requires that butylenes and isobutane be used only in the manufacture of aviation gasoline, synthetic rubber, or their components. The directive also requires refiners and natural gasoline manufacturers to inform PAW of the quantities and composition of their hydrocarbon mixtures containing butylenes and isobutane that are not now being so utilized.

CURRENT PRICES

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 Nov. 1941 $1.012 Nov. 1942 $0.922 Nov. 1943 $0.900

	Current Market		1943		1942	
			Low	High	Low	High
Acetaldehyde, 99%, drs. wks. lb.	.11	.14	.11	.14	.11	.14
Acetic Anhydride, drs, ...lb.	.11½	.13	.11½	.13	.11½	.13
Acetone, tks, delv (*PC*) ..lb.	...	.07	...	.07	.07	.158
ACIDS						
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	3.38	3.63
glacial, bbls. ....100 lbs.	9.15	9.40	9.15	9.40	9.15	9.40
tks, wks ..... 100 lbs	...	6.93	...	6.93	6.25	6.93
Acetylsalicylic, Standard USP ....lb.	.40	.54	.40	.54	.40	.40
Benzoic, tech, bbls .....lb.	.39	.43	.39	.43	.43	.47
USP, bbls .... lb.	.54	.59	.54	.59	.54	.59
Boric, tech, bbls, c-l, ..ton *a*	...	109.00	...	109.00	108.00	109.00
Chlorosulfonic, drs, wks lb	.03	.04½	.03	.04½	.03	.04½
Citric, crys, gran, bbls, lb. *b*	.20	.24	.20	.24	.20	.21
Cresylic 50%, 210-215 HB, drs, wks, frt equal (A) gal.	.81	.83	.81	.83	.81	.86
Formic, Dom. cbys ......lb.	.10½	.11½	.10½	.11½	.10½	.11½
Hydrofluoric, 30% rubber, dms. ....lb.	.08	.09	.08	.09	.06	.06½
Lactic, 22%, lgt, bbls wks lb.	.039	.0415	.039	.0415	.039	.0415
44%, light, bbls wks lb	.073	.0755	.073	.0755	.073	.0755
Maleic, Anhydride, drs lb	.25	.26	.25	.26	.25	.26
Muriatic, 18° cbys ...100 lb.	1.50	2.45	1.50	2.45	...	...
20° cbys, c-l, wks ..100 lb.	...	1.75	...	1.75	1.75	1.75
22° cbys, c-l, wks 100 lb.		2 25		2.25	2.25	2.25
Nitric, 36°, cbys, wks 100 lbs. *c*	5.00	5.95	5.00	5.95	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5 50	..	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	...	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	..	6.50	...	6.50	6.50	6.50
Oxalic, bbls, wks (*PC*) .lb.	.11¼	.12½	.11¼	.12½	.11¼	.14½
Phosphoric, 75% USP, .lb.	.10½	.13		.12	.12	12
Salicylic, tech, wks (*PC*) ..lb.	.26	.42	.26	.42	...	.33
Sulfuric, 60°, tks, wks ..ton		13 00		13.00	..	13.00
66°, tks, wks ....ton	...	16.50	...	16.50	...	16.50
Fuming (Oleum) 20% tks. wks ....ton	...	19 50	...	19.50	...	19.50
Tartaric, USP, bbls ......lb.	...	.70½	...	.70½	...	.70½
Alcohol, Amyl (from Pentane) tks, delv ...... lb	...	.131	...	.131	...	...
Butyl, normal, syn, tks (PC) ....lb.	...	.10¾	...	.10¾	.10¾	.168
Denatured, CD, 14, c-l drs, (*PC, FP*) ...gal. *d*	...	.54½	...	.54½	...	.65
Denatured, SD, No. 1, tks. *d*	...	.50	...	.50	...	.53
Ethyl, 190 proof tks.... gal	...	11.90	...	11.90	8.12	11.92
Isobutyl, ref'd, drs .....lb.	...	.086	...	.086	...	.086
Isopropyl, ref'd, 91% gal.	...	.66½	...	.66½	.40½	.43½
Propyl, nor, drs, wks gal	.67	.70	.67	.70	.69	.75
Alum, ammonia, lump, bbls, wks ....100 lb.	...	4.25	...	4.25	..	4.25
Aluminum metal, (*FP*) 100 lb.	15.00	16.00	15.00	16.00	15.00	16.00
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
Hydrate, light, (A) ....lb.	.14½	.15	.14½	.15	...	.14½
Sulfate, com, bgs. wks 100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
Sulfate, iron-free, bgs, wks ....100 lb.	2.35	2.50	2.35	2.50	1.75	1.85
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16		.16
Ammonium Carbonate, lumps, dms ....lb.	.08½	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, whi, bbls, wks, 100 lb.	4.45	5.15	4.45	5.15	4.45	.
Nitrate, tech. bags. wks. lb.	.0435	.0850	.0435	.0850	.0435	.0455
Oxalate pure, grn, bbls. .lb.	.27	.33	.27	.33	.27	.33
Perchlorate, kgs (A) ...lb.	.55	.65	.55	.65	.55	.65
Phosphate, dibasic tech, bbls ....lb.	.07¼	.08½	.07¼	.08½	.09¼	.09¼
Stearate, anhyd, dms ...lb.	...	.34	...	.34	...	.24½
Sulfate, f.o.b., bulk (A) ton	28.20	29.20	29.00	30.00	29.00	30.00
Amyl Acetate (from pentane) c-l, drs, delv ....lb.	...	.18½	...	.18½	...	...
Aniline Oil, drs ....lb.	.11½	.12½	.11½	.12½	.12½	.16
Anthraquinone, sub, bbls .lb.	...	.70	...	.70	...	.70
Antimony Oxide, 500 lb. bbls (A) ....lb.	.15	.15½	.15	.15½	.15	.16½
Arsenic, whi, kgs (A) .. lb	.04	.04¾	.04	.04¾	.04	.04¾
Barium Carbonate precip. lb bgs, wks ....ton	55.00	60.00	55.00	60.00	55.00	65.00
Chloride, delv, zone 1 . ton	77.00	90.00	77.00	90.00	77.00	92.00

USP $25 higher; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal; *c* Yellow grades 25c per 100 lbs. less in each case; *d* Prices given are Eastern schedule. *a* Powdered boric acid $5 a ton higher; *b* Powdered citric is ½c higher;

Current Prices

Barytes
Gums

	Current Market		1943 Low	1943 High	1942 Low	1942 High
Barytes, floated, bbls. ....ton	...	**36.00**	...	**36.00**	...	...
Bauxite, bulk mines (A) ton	7.00	10.00	7.00	10.00	7.00	10.00
Benzaldehyde, tech, cbys, dms lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	(A)	.15	(A)	.15	...	.15
Benzyl Chloride, cbys ....lb.	.22	.24	.22	.24	.22	.24
Beta-Naphthol, tech, bbls, wks ....lb.	.23	.24	.23	.24	.23	.24
Bismuth metal, ton lots...lb.	...	1.25	...	1.25	...	1.25
BlancFixe, Pulp, bbls, wks ton *h*	40.00	46.50	40.00	46.50	40.00	46.50
Bleaching Powder, wks, 100 lb.	2.50	3.60	2.50	3.60	2.25	3.10
Borax, tech, c-l, bgs ....ton *i*	...	45.00	...	45.00	45.00	46.00
Bordeaux Mixture, drs ..lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.25	.30	.25	.30	.25	.30
Butyl, acetate, norm drs, lb.	.1755	.1805	.1755	.1805	.124	.168
Cadmium Metal (*PC*) .lb.	.90	.95	.90	.95	.90	.95
Calcium, Acetate, bgs. 100 lb.	3.00	4.00	3.00	4.00	3.00	4.00
Carbide, drs ....ton	50.00	95.00	50.00	95.00	...	...
Carbonate, tech, c-l bgs, ton	18.00	22.00	18.00	22.00	16.00	20.00
Chloride, flake, bgs c-l ton	18.50	35.00	18.50	35.00	...	21.00
Solid, 73-75% drs, c-l, ton	18.00	31.50	18.00	31.50	18.00	34.50
Gluconate, U.S.P., drs. lb.	.57	.58	.57	.58	.52	.59
Phosphate, tri, bbls, cl . lb.	...	.0635	...	.0635	.0635	.0705
Camphor, U.S.P., gran, powd, bbls ....lb.	.68½	.70½	.68½	.70½	...	...
Carbon Bisulfide, 55-gal drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Dioxide, cyl ....lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) cl, Zone 1, 52½ gal drms ....lb.	.73	.80	.73	.80	.73	.83
Casein, Acid Precip, bgs, 100 or more ....lb.	...	.24	...	.24	.15	.30½
Chlorine, cyls, lcl, wks, contract (*FP*) (A) .....lb.	...	.07¾	...	.07¾	...	.07¾
cyls, c-l, contract ..lb. *j*	...	.05¾	...	.05¾	...	.05¾
Liq, tk, wks, contract 100 llb.	...	1.75	...	1.75	...	1.75
Chloroform, tech, drs ....lb.	.20	.23	.20	.23	.20	.23
Coal tar, bbls, crude ....bbl.	8.25	8.75	8.25	8.75	7.50	9.25
Cobalt Acetate, bbls (A) lb.	...	.83¾	...	.83¾	...	.83¾
Oxide, black kgs (A) ..lb.	...	1.84	...	1.84	...	1.84
Copper, metal *FP*, *PC* 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Carbonate, 52-54%, bbls lb.	.19½	.20	.19½	.20½	.18	.20½
Sulfate, bbls, wks (A) 100 lb.	5.00	5.50	5.00	5.50	5.15	5.50
Copperas, bulk, c-l, wks ..ton	..	14.00		14.00		17.00
Cresol, USP, drs, (A) ....lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.11½
Cyanamid, bgs ....ton	1.52½	1.62½	1.52½	1.62½	no prices	
Dibutylamine, c-l, drs. wks lb.	...	.61	...	.61	.50	.61
Dibutylphthalate, drs .....lb.	.2060	.2110	.2060	.2110	.21	.23½
Diethylaniline, lb drs . lb.	.	.40	...	.40	...	.40
Diethyleneglycol, drs lcl. wks. lb.	.14	.15½	.14	.15½	.14	.15½
Dimethylaniline, dms., cl., lcl. lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs ..lb.	.1875	.1925	.1875	.1925	...	.20
Dinitrobenzene, bbls ......lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, dms lb.	...	.14	...	.14	...	.14
Dinitrophenol, bbls ......lb.	...	.22	...	.22	...	.22
Dinitrotoluene, dms ......lb.	...	.18	...	.18	...	.18
Diphenyl, bbls lcl. wks ....lb.	.16	.20	.16	.20	.15	.16
Diphenylamine bbls ......lb.	...	.25	...	.25	...	.25
Diphenylguanidine, drs ...lb.	.35	.37	.35	.37	.35	.37
Ethyl Acetate, 85% Ester tks, frt all'd ....lb.	.107	.110	.107	.110	.11	.12
Chloride, drs ....lb.	.18	.20	.18	.20	.18	.20
Ethylene Anhydrous frt all'd ....lb.	...	.75	...	.75	...	.75
Dichloride, cl wks ....drs, E. Rockies dms, cl. ..lb.	...	.0842	...	.0842	...	.0742
Glycol, dms, cl. .... lb.	...	.10	...	.10	.14½	.18½
Fluorspar, No. 1, grd. 95-98% bulk, cl-mines ....ton	...	37.00	...	37.00	...	...
Formaldehyde, c-l, bbls, wks (*FP*, *PC*) lb.	.0550	.0575	.0550	.0575	.055	.0575
Furfural tech, drs, c-l, wks lb.	..	.12½	..	.12½	..	.12½
Fusel Oil, refd, dms, dlvd lb.	.18½	.19½	.18½	.19½	.18	.19½
Glauber's Salt, bgs, wks 100 lb.	1.05	1.25	1.05	1.25	1.05	1.28
Glycerin (*PC*) CP, drs, c-l, lb.	...	.18¾	...	.18¾	...	.18¾
Saponification, drs, c-l, lcl or tks ....lb.	...	.12¾	...	.12¾	...	.12¾

GUMS

	Current Market		1943 Low	1943 High	1942 Low	1942 High
Gum Arabic, amber sorts bgs ....lb.	.14½	.15	.14½	.15	.14½	.24
Benzoin Sumatra, CS ....lb.	.60	.65	.60	.65	.45	.55
Copal, Congo, ...lb.	...	.55¾	...	.55¾	...	...
Copal, East India, chips ..lb.	...	.12	...	.12	...	...
Macassar dust ....lb.	...	.07⅜	...	.07⅜	...	.17⅜
Copal Manila,	.13½	.15½	.13½	.15½	.14	.14½
Copal Pontianak, bold (A) lb.	...	.23⅜	...	.23⅜	.22⅜	.22⅞
Ester ....lb.	.09½	.12	.09½	.12	.08½	.10
Karaya, bbls, bxs, drs ...lb.	.14	.36	.14	.36	.14	.33

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls, carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks

h Lowest price is for pulp; highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case;

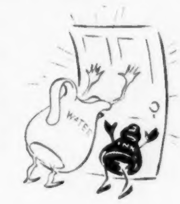
Technical-ities

By Ed. Rosendahl

Anti-corrosive protective coating for metal parts can readily be obtained by the use of SUBLAN, a lanolin substitute which is now available.

Lubricant for molding thermosetting plastics is obtained by the use of a high melting point synthetic wax now available in powdered form under the name of ACRAWAX C POWDERED.

The water and ink resistance of lacquers is increased considerably by the incorporation of a solution of FLEXO WAX C LIGHT.



Textile emulsions of oils and waxes stable in the presence of sulfuric acid, aluminum sulfate and other electrolytes can readily be made by the use of EMULGOR A, an emulsifying agent which has a high degree of stability under adverse conditions.

Wax coatings for paper used in packaging of sticky candies and other products can be improved by the addition of a white, odorless, synthetic wax known as ALBACER. ALBACER in conjunction with paraffin wax gives increased "slip" so that the candies can easily be released from the paper.

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Each Month these and many other uses of our products will be mentioned here. However, you should have a copy of our catalogue, "Chemicals by Glyco," which covers a wide range of product uses. Just send to Glyco Products Company, Inc., 26 Court Street, Brooklyn 2, New York.

Current Prices

Gums
Salt Cake

		Current Market		1943 Low	1943 High	1942 Low	1942 High
Kauri, N Y (A)							
Brown XXX, bgs	lb.	...	.77	...	.77	.60	.77
Pale XXX	lb.	...	.65¼	...	.65¼	.61	.66
No. 3	lb.	...	.22	...	.22	.17¾	.22
Sandarac, cs	lb.	...	.97½	...	.97½	.95	1.10
Tragacanth, No. 1, cases	lb.	4.00	4.25	4.00	4.25	3.50	4.00
No. 3	lb.	1.10	1.20	1.10	1.20	1.10	1.20
Yacca, bgs (*PC*)	lb.	.06	.07¼	.06	.07¼	.06	.07¼
Hydrogen Peroxide, cbys	lb.	.15½	.18½	.15½	.18½	.16	.18½
Iodine, Resublimed, jars	lb.	2.00	2.10	2.00	2.10	...	2.00
Lead Acetate, cryst, bbls	lb.		.12½		.12½	.12	.13¼
Arsenate, bg, c-l	lb.	.11½	.12	.11½	.12	.11	.12
Nitrate, bbls	lb.	...	.12½	...	.12½	.11	.14
Red, dry, 95% Pb_3O_4, lcl	lb.	.09	.10¾	.09	.10¾	.09	.10¾
97% Pb_3O_4, bbls delv	lb.	.09¼	.11	.09¼	.11	.09¼	.09½
98% Pb_3O_4, bbls delv	lb.	.09½	.11¼	.09½	.11¼	.09½	.10½
White, bbls, lcl	lb.	...	.08¾	...	.08¾	...	.07½
Basic sulfate, bbls, lcl	lb.	...	.08	...	.08	.06½	.07½
Lime, Chem., wks, bulk	ton	6.25	13.00	6.25	13.00	7.00	13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	16.00
Litharge, coml, delv, bbls	lb.	.08	.09¾	.08	.09¾	.079	.08
Lithopone, ordi., (*PC*), bgs	lb.	.04½	.04¾	.04½	.04¾	...	.04¼
Magnesium Carb, tech, wks	lb.	.06¼	.09½	.06¼	.09½	...	.06¼
Chloride flake, bbls, wks c-l	ton	...	32.00	..	32.00	...	32.00
Manganese, Chloride, bbls	lb.	.14	nom.	.14	nom.	.13	.14
Dioxide, tech bgs, lcl	ton	...	74.75	...	74.75	...	74.75
Methanol, pure, nat, drs	gal *l*	.63	.76	.63	.76	.55½	.61½
Synth, drs cl	gal. *m*	.34½	.40½	.34½	.40½	.34½	.40½
Methyl Acetate, tech tks	lb	.06	.07	.06	.07	.06	.07
C.P. 97-99%, tks, delv	lb	.09½	.10½	.09½	.10½	.09½	.10½
Chloride, cyl	lb.	.31	.40	.31	.40	.32	.40
Ethyl Ketone, tks, frt all'd	lb	...	.08	...	.08	...	.08
Naphtha, Solvent, tks	gal	...	.27	...	.27	...	.27
Naphthalene, crude, 74°, wks tks	lb.	...	.0275	...	.0275	...	...
Nickel Salt, bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Nitre Cake, blk	ton	...	16.00	...	16.00	...	16.00
Nitrobenzene, drs, wks	lb	.08	.09	.08	.09	.08	.09
Orthoanisidine, bbls	lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs	lb	...	.32	...	.32	...	.32
Orthodichlorobenzene, drms	lb.	.07	.08	.07	.08	.06	.07½
Orthonitrochlorobenzene, wks	lb	.15	.18	.15	.18	.15	.18
Orthonitrotoluene, wks	lb	..	.09	...	.09	...	.09
Para aldehyde, 98%, wks	lb.	...	.12	...	.12	...	.12
Chlorophenol, drs	lb	...	.32	...	.32	...	.32
Dichlorobenzene, wks	lb	.11	.15	.11	.15	.11	.12
Formaldehyde, drs, wks (*FP*)	lb	.23	.24	.23	.24	.23	.24
Nitroaniline, wks, kgs	lb.	.43	.45	.43	.45	...	.45
Nitrochlorobenzene, wks	lb		.15		.15		.15
Penetaerythritol, tech, bl	lb.	.29	.33	.29	.33	.33½	.35½
Toluenesulfonamide, bbls	lb		.70		.70		.70
Toluidine, bbls, wks	lb.	...	.48	...	.48	...	.48

PETROLEUM SOLVENTS AND DILUENTS

		Current Market		1943 Low	1943 High	1942 Low	1942 High
Lacquer diluents, tks, East Coast	gal.	...	.11	...	.11	...	.11
Naphtha, V.M.P., East tks, wks	gal.	...	.11	...	.11	.10½	.11
Petroleum thinner, 43-47, East, tks, wks	gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Rubber Solvents, stand grd, East, tks, wks	gal.	...	.11	...	.11	.10½	.11
Stoddard Solvents, East, tks, wks	gal.	...	.09½	...	.09½	...	.09½

		Current Market		1943 Low	1943 High	1942 Low	1942 High
Phenol, U.S.P., drs (A)	lb.	.10½	.13¼	.10½	.13¼	.12½	.13
Phthalic Anhydride, cl and lcl, wks (A)	lb.	.13	.14	.13	.14	.14½	.15½
Potash, Caustic, wks, sol	"	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake	lb.	.07	.07½	.07	.07½	...	.07
liquid, tks	lb.		.0275		.0275		.0275
dms, wks	lb.	.03	.03¼	.03	.03¼	.03	.03¼
Potassium Bichromate cake *(*FP*)	lb.	.09½	.10	.09½	.10	...	.09½
Bisulfate, 100 lb kgs	lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, hydrated 83-85% calc	lb.	.05½	.05¾	.05½	.05¾	.06½	.06¾
Chlorate crys, kgs, wks (A)	lb.	.11	.13	.11	.13	nom.	.11
Chloride, crys, tech, bgs, kgs	lb.	.08	nom.	.08	nom.	.08	nom.
Cyanide, drs, wks	lb.	...	.55	...	.55		.55
Iodide, bots., or cans	lb.	1.44	1.48	1.44	1.48	1.44	1.48
Muriate, bgs, dom, blk unit Per Unit K_2O	ton	.53½	.56	.53½	.56	.56	.58
Permanganate, USP, wks (*FP*) dms	lb.	.20½	.21	.20½	.21	.19¾	.21
Sulfate, 90% basis, bgs	ton	...	36.25	..	36.25		36.25
Propane, group 3, tks (*PC*)	gal.	.	.03¼	.	.03¼	.02¼	.03¼
Pyridine, ref., drms	lb	.45½	.46	.45½	.46	...	.46
R Salt, 250 lb bbls, wks	lb		.55		.55		.55
Resorcinol, tech., drms, wks	lb.	.68	.75	.68	.75	.68	.74
Rochelle Salt, cryst	lb.	.43½	.47	.43½	.47		.43½
Salt Cake, dom. blk wks	ton	..	15.00	.	15.00	...	15.00

l Producers of natural methanol divided into two groups and prices vary for these two divisions; *m* Country is divided in 4 zones, prices varying by zone.

* Spot price is ½c higher.

	Current Market		1943 Low	1943 High	1942 Low	1942 High
Saltpetre, grn, bbls . . . 100 lb.	8.20	8.60	8.20	8.60	. . .	8.20
Shellac, Bone dry, bbls lb. r	.42½	.46	.42½	.46	.39	.42½
Silver Nitrate, 100 oz, bots . . . . oz.	. . .	.32¼	. . .	.32¼	.26¼	.32¼
Soda Ash, 58% dense, bgs, c-l, wks . . . 100 lb.	. . .	1.15	. . .	1.15	. . .	1.15
58% light, bgs cl . . . 100 lb.	. . .	1.13	. . .	1.13	1.05	1.13
Caustic, 76% grnd drms, cl . . . . 100 lb.	. . .	2.70	. . .	2.70	. . .	2.70
76% solid, drms, cl 100 lb.	. . .	2.30	. . .	2.30	. . .	2.30
Liquid, sellers tks 100 lb.	. . .	1.95	. . .	1.95	. . .	2.00
Sodium Acetate, 60% tech, powd, flake, bbls, wks lb	.05	.06	.05	.06		.05
Benzoate, USP dms . . . . lb.	.46	.52	.46	.52	.46	.50
Bicarb, bbl, wks . . . . 100 lb.	1.70	2.05	1.70	2.05	1.70	1.85
Bichromate, cks, wks (*FP*) lb	. . .	.07¾	. . .	.07¾	. . .	.07¾
Bisulfite powd, bbls, wks . . . . 100 lb.	3.00	3.60	3.00	3.60	3.00	3.10
35-40% bbls, wks . . 100 lb.	1.40	1.65	1.40	1.65	1.35	1.80
Chlorate, bgs, wks (A) lb.	. . .	.06¼	. . .	.06¼	. . .	.06¼
Cyanide, 96-98%, wks . . lb.	.14½	.15	.14½	.15	.14	.15
Fluoride, 95%, bbls, wks lb.	.07¼	.08¼	.07¼	.08¼	. . .	.08
Hyposulfite, cryst, bgs, cl, wks . . . . 100 lb.	. . .	2.25	. . .	2.25	. . .	2.45
Metasilicate, gran, bbl, wks . . . . 100 lb.	2.50	3.55	2.50	3.55	. . .	2.50
Nitrate, imp, bgs (A) ton	. . .	33.00	. . .	33.00	. . .	29.35
Nitrite, 96-98% dom, cl. lb.	. . .	.06¼	. . .	.06¼	. . .	.06¼
Phosphate, di- wks . . 100 lb.	6.00	7.25	6.00	7.25	. . .	. . .
cryst, bgs, c-l . . . . 100 lb.	2.55	2.70	2.55	2.70	2.55	2.70
Tri-bgs, cryst, wks 100 lb.	2.70	3.45	2.70	3.45	2.70	2.85
Prussiate, yel, bbls, wks lb.	.10	.11	.10	.11	. . .	.11
Pyrophosphate, bgs wks c-l lb.	.0528	.0610	.0528	.0610	.053	.06
Silicate, 52°, drs. wks 100 lb.	1.40	1.80	1.40	1.80	. . .	1.70
40°, drs, wks, c-l 100 lb.	. . .	.80	. . .	.80	. . .	. . .
Silicofluoride, bbls NY lb.	.06	.12	.06	.12	.09	.15
Sulfate, Anhyd, bgs 100 lb.	1.70	1.90	1.70	1.90	1.70	1.90
Sulfide, cryst c-l, bbls, wks . . . . lb.	. . .	2.40	. . .	2.40	. . .	2.40
Solid, bbls, c-l, wks lb.	3.15	3.90	3.15	3.90	. . .	3.15
Sulfite, powd, bbls, wks lb.	.05¼	.06	.05¼	.06	. . .	.05¼
Starch, Corn, Pearl, bgs . . . . 100 lb.	. . .	3.46	. . .	3.46	. . .	3.10
Potato, bgs, cl . . . . lb.	. . .	.0637	. . .	.0637	.061	.0637
Rice, bgs . . . . lb.	no stocks		no stocks		.09	.10
Sweet Potato, bgs . . 100 lb.	. . .	.07½	. . .	.07½	no stocks	
Sulfur, crude, f.o.b. mines ton	. . .	16.00	. . .	16.00	. . .	16.00
Flour, USP, precp, bbls, kgs . . . . 100 lb.	.18	.30	.18	.30	. . .	. . .
Roll, bbls . . . . 100 lb.	2.40	2.90	2.40	2.90	2.40	2.70
Sulfur Dioxide, liquid, cyl. lb.	.07	.08	.07	.08	.07	.09
tks, wks . . . . lb.	.04	.06	.04	.06	.04	.06
Talc, crude, c-l, NY . . . ton	. . .	13.00	. . .	13.00	12.50	24.50
Ref'd, c-l, NY . . . . ton	13.00	21.00	13.00	21.00	17.25	19.25
Tin, crystals, bbls, wks . . . lb.	no stocks		no stocks		no stocks	
Metal, (*PC*) (A) . . . . . . lb.	. . .	.52	. . .	.52	. . .	.52
Titanium Dioxide (*PC*) . . lb.	.15	.15¾	.15	.15¾	. . .	.14½
Toluol, drs, wks (*FP*) (A) gal.	. . .	.33	. . .	.33	. . .	.33
tks, frt all'd (*FP*) . . . . gal.	. . .	.28	. . .	.28	. . .	.28
Tributyl Phosphate, dms lcl, frt all'd . . . . lb.	. . .	.47	. . .	.47	. . .	.47
Trichlorethylene, dms, wks lb.	.08	.09	.08	.09	. . .	.08
Tricresyl phosphate (*FP*) lb.	.24	.54½	.24	.54½	.25	.31
Triethylene glycol, dms lcl lb.	. . .	.26	. . .	.26	. . .	.26
Triphenyl Phos, bbls (*FP*) lb.	.31	.32	.31	.32	.31	.32
Urea, pure, cases . . . . lb.	. . .	.12	. . .	.12	. . .	.12
Wax, Bayberry, bgs . . . lb.	.25	.26	.25	.26	.18	.20
Bees, bleached, cakes . . . lb.	. . .	.60	. . .	.60	.58	.61
Candelilla, bgs . . . . lb.	.38	.48	.38	.48	.33	.38
Carnauba, No. 1, yellow bgs, ton . . . . lb.	.83¼	.93¼	.83¼	.93¼	.83¼	.89
Xylol, frt all'd, tks, wks gal.	. . .	.27	. . .	.27	. . .	.27
Zinc Chloride fused, wks lb.	.05	.0535	.05	.0535	. . .	.05
Oxide, Amer, bgs, wks lb.	.07	.07½	.07	.07½	. . .	.07¼
Sulfate, crys, bgs, . . 100 lb.	3.60	4.35	3.60	4.35	3.60	3.65

Oils and Fats

	Current Market		1943 Low	1943 High	1942 Low	1942 High
Babassu, tks, futures . . . lb.	. . .	.111	. . .	.111	no prices	
Castor, No. 3, bbls . . . . lb.	.13¾	.14¼	.13¾	.14¼	.12½	.13¾
China Wood, drs, spot NY lb.	. . .	.39	. . .	.39	.39	.40¼
Coconut, edible, drs NY lb.	. . .	.0985	. . .	.0985	. . .	. . .
Cod Newfoundland, dms gal	. . .	.90	. . .	.90	.85	.90
Corn, crude, tks, wks . . . . lb.	. . .	.12¾	. . .	.12¾	.12½	.12¾
Linseed, Raw, dms, c-l . . . lb.	. . .	.1510	. . .	.1510	.117	.143
Menhaden, tks, Baltimore gal	. . .	.089	. . .	.089	.63¾	.666
Light pressed, drs . . . . lb	.1305	.1307	.1305	.1307	.11	.139
Oiticica, liquid, dms . . . . . lb.	. . .	.25	. . .	.25	. . .	. . .
Oleo, No. 1, bbls, NY . . lb	.13¾	nom.	nom.	.13¼		.13¼
Palm, Niger, dms . . . . lb.	. . .	.0865	. . .	.0865	.0925	. . .
Peanut, crude, tks, f.o.b. wks . . . . lb.	. . .	.18	. . .	.18	.12⅞	.13
Perilla, crude dms, NY (A) lb.	. . .	.245	. . .	.245	. . .	.246
Rapeseed, denat, bulk . . . . lb.		.1150		.1150	. . .	
Red, dms . . . . lb.	.13¼	.14¼	.13¼	.14¼	.11¼	.143
Soy Bean, crude, tks, wks lb.	. . .	.1175	. . .	.1175	.12¼	nom.
Tallow, acidless, bbls . . . . lb.	. . .	.14¼		.14¼	. . .	
Turkey Red, single, drs . . lb.	.10	.14½	.10	.14½	. . .	.08¾

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b N. Y., refined 6c higher in each case.

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Patents

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1—9'8" dia. x 18'2" long, 10,000-gal. cap.
1—7'1" dia. x 11'0" long, 3,168-gal. cap.
1—10'0" dia. x 11'10" long, Lined with Acid-Resisting Brick, 6,600-gal. cap.
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1—10'0" dia. x 6'6" high, 3,715-gal. cap.
1—9'6" dia. x 11'10" high, Lined with Acid-Resisting Brick, 6,200-gal. cap.
1—10'0" dia. x 8'9", on shell, 5,200-gal. cap.
1—10'0" dia. x 6'2", on shell, 3,700-gal. cap.

COPPER COLUMNS

1—2'6" dia., 41 Plts., Brz. Bubbling Troughs
1—4'7" dia. x 19'6" high, Lined with Acid-Resisting Brick, Packed with Porcelain Raschig Rings
1—21" dia. x 11'4" high. Details as above.
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1—Oval Type, 36" on short dia., 20 Plates, Cast Bronze Bubbling Troughs
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3'0" dia. x 27'0" high, Complete with Agitator, Lined with Acid-Resisting Brick

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Bronze Tube Sheets, Copper Tubes, Copper or Steel Shells Ranging in Size from 100 to 1,000 Sq. Ft. of Surface

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6'0" dia. Cast Iron Column, 36 Plates
4'6" dia. Copper Col., 24 Bubble Cap Plts.
5'0" dia. Copper Cooker, Complete with Agitator
Rotary Steam Dryers, Compl. with Trunions
1—4'0" dia. x 23'0" long
1—6'0" dia. x 23'0" long
4—Juice Heaters, Steel Shell, Brass Tubes, 42" dia. x 9'0" long
Copper Tanks: Cap., 330 gals., 6,800 gals., 6,950 gals., 7,700 gals., 8,700 gals.
5—Spray Towers, Copper, 8'0" dia. x 23'0" high, Dished Head, Conical Bottom, Complete with All Connections, etc.
Ammonia Coolers
Bucket Elevator, 105'0" high, Buckets 6" x 11", Compl. with Drive, Pulley, and Belt
2—Hammer Mills: 1, Williams Little Grant, Cap. 400 to 600 lbs. corn per hour through 1/16" screen; 1, Williams, Cap. 1,000 to 1,200 lbs. corn per hour through 1/16" screen
Pumps—Centrifugal and Steam, all sizes
4—Tank Sand Filter Systems, Each 3'0" dia. x 5'0" high, with fittings and "I" Beams
Peabody Oil Burner—Never Used—Suitable for 150 h.p. Boiler
3—Falk Speed Reducers, 30 h.p., 1,165 r.p.m. to 117.5 r.p.m. output speed. Complete with Couplings and bases
Crocker-Wheeler Vertical Motor Reducer, 25 h.p., 1,200 r.p.m. to 90 r.p.m. output speed. Complete with Enclosed, Fan-Cooled Motor
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1—Buflovak 24" x 20" Vacuum Drum Dryer
1—Buflovak 32" x 90" Atmospheric Double Drum Dryer, excellent condition
1—Raymond 4 Roll High Side Roller Mill
4—Tolhurst 40" Bottom Discharge Centrifugals
2—Buffalo 6' Atmospheric Crystallizers
15—Pebble Mills, Lab. to 600 gals.
10—Filter Presses, 12" x 12" to 36" x 36"
6—Tolhurst 32", 40", 48", 60" Centrifugals
10—Steel, Lead Lined Kettles, 1,000 to 1,700 gals.
3—Sharples No. 6 Centrifuges
3—Oliver Rotary Filters, 5' x 6', 6' x 6', 5' x 8'

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4—ROTEX SIFTERS, No. 432, triple deck, 40" x 84", m. d. with 2 H. P., A. C. motors.

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BUSINESS OPPORTUNITIES

PROFESSIONAL DIRECTORY

(Continued from page 896)

Memphis office, is district manager. The new offices are located at 411 Bona Allen Building, Spring & Luckie Streets. The Memphis office will be closed at the end of December. All southern operations formerly cleared through Memphis will now be handled through Atlanta.

PRESSED STEEL TANK COMPANY announces the appointment of the Anchor Petroleum Co. of Tulsa, Okla., as the exclusive representative for the sale of its Hackney liquefied petroleum gas cylinders in the Republic of Mexico.

COCHRANE STEAM SPECIALTY COMPANY has added Joseph L. Dudley to its organization. Mr. Dudley was formerly associated with Jackson & Moreland, Engineers, and with Stone & Webster Engineering Corp.

LUKENS STEEL COMPANY has appointed William G. Theisinger assistant to the vice-president. He was formerly director of welding research with the company. Thomas T. Watson will become the new director of research, with D. Bruce Johnston as his assistant. Samuel S. Lemmon has been appointed research metallurgist.

INDUSTRIAL TRENDS

STEEL: Steel operations during week ending Dec. 18 declined one-half point to 98.5 per cent of rated capacity. It is expected that output for the next week will be at about the same level.

While part of the small decline was attributed to repairs, more was charged to lessening of demand for some steel items. However, according to observers, the present situation gives no indication of any sharp decline in steel activity. It is said the picture presents one of maldistribution in "product mix" rather than a definite over-all serious tapering in demand.

COMMODITIES: During week ending Dec. 18 the Irving Fisher index of wholesale commodity prices was 111.65, a rise of 0.07 per cent over the previous week's level of 111.57. The raw materials index rose 0.3 per cent as a result of price increases in cotton, grains, hay and livestock, which were slightly offset by decreases in apples, oranges and potatoes. The rise in the ceiling on anthracite coal was a contributing factor to the increase in this index and also the fuel and lighting index, which rose 0.5 per cent.

ELECTRICITY: Electric power production for week of Dec. 10 rose seasonally to a new all-time peak of 4,560,158,000 kilowatt hours; up from 4,403,342,000 in the preceding week.

COAL: Bituminous coal output increased from 12,450,000 to 12,600,000 tons.

CRUDE OIL: Daily crude oil production fell off from 4,413,650 to 4,384,250 barrels.

BUSINESS BAROMETERS: Bank clearings in 22 cities outside of New York rose from $3,457,200,000 for week of Dec. 10 to $3,842,494,000; this is 9 per cent above last year. Freight carloadings recorded an increase from 820,082 to 862,759 cars.

COTTONSEED OIL: Total stocks of cottonseed oil, lard and creamery butter on November 1st were the largest since February 1, 1942, due to the increase in visible supply of cottonseed oil. The total was 1,037,277,000 pounds, compared to 891,446,000 pounds the previous month and 929,232,000 pounds November 1, 1942.

Company	*Period*	**Taxes** *1943-1942*	**Net Profit** *1943-1942*
Baker (J. T.) Chemical Co.	Year to June 30	$827,500-.........	$174,525-.........
Davison Chemical Corp., The	Year to June 30	$917,358.73-.........	$1,293,007.62-.........
Internatl's Minerals & Chemical Corp.	Year to June 30	$1,300,000-$661,484	$2,075,601-$1,660,404
McKesson & Robbins, Inc.	Year to June 30	$10,639,226-$4,421,362	$5,097,371-$5,318,538
Vick Chemical Co.	Year to June 30	$3,761,769-$2,222,360	$2,264,889-$2,211,430

INDEX TO ADVERTISERS

INDEX TO ADVERTISERS

"WE"-EDITORIALLY SPEAKING

The staff of CHEMICAL INDUSTRIES wishes you and yours a Merry Christmas and a Happy New Year. It may seem a little incongruous to some during these days of so much ill will among the peoples of the world that we continue our tradition of the season's greetings. And yet, when one considers what our men all over the world are fighting for, it is entirely fitting that we should uphold this tradition. For this joyous season is part and parcel of America. It typifies the things for which our nation is willing to shed its blood, sweat and tears.

We may be happy in the thought that each day the future grows brighter and our victory over the forces of oppression becomes more assured. We can hope that by this time next year our relatives, friends and former associates will be back with us for a truly Merry Christmas and Happy New Year.

As the end of the year approaches we wish to take this opportunity to express our appreciation for the sincere efforts and great helpfulness of our Consulting Editorial Board. The members of this board, since its inception sixteen years ago, have all been outstanding men in the chemical industry, who have given unselfishly of their time and knowledge without monetary reward and with but one purpose in mind—to render service to the readers of this publication and to the chemical industry as a whole.

At present the board is composed of Robert T. Baldwin, L. W. Bass, Benjamin T. Brooks, J. V. N. Dorr, Charles R. Downs, William M. Grosvenor, and Walter S. Landis.

We are sure that our readers wish to join us in our thanks to these men for their guidance and help and in our hope that the year 1944 will prove happy and prosperous for them.

During the past few years the country has certainly been mixed up about the rubber situation. Not the least of the confusion in the public's mind was caused by the nonchalant tossing about of chemical and technical terms by everyone from columnists to government officials and even some so-called technical experts. However, in our muddling way we seem to have gotten most of the job of actually making rubber done. And now to get us all straightened out on our definitions the Hycar Chemical Co. has published the first dictionary of synthetic rubber words.

Fifteen Years Ago

From Our Files of December, 1928

Association of Consulting Chemists and Chemical Engineers is organized in New York at a meeting held at the Chemists' Club, November 9.

Bayer-Semesan Co., Inc., is formed to take over the business formerly conducted by the seed disinfectant divisions of the Bayer Co., Inc., and E. I. du Pont de Nemours & Co., Inc.

Dr. E. C. Sullivan, Corning Glass Works, Corning, N. Y., is awarded Perkin Medal for 1929 for his work on special glasses of the pyrex type.

The first shipment of anhydrous ammonia was made during November from the new plant of Allied Chemical & Dye Corp. at Hopewell, Va.

U. S. Industrial Alcohol Co., New York, announces that Dr. Arthur A. Backhaus, production manager, has been elected vice-president of the company.

Howard W. Sherrill, president, Welch, Holme & Clark Co., New York, dies unexpectedly at his home in East Orange, N. J., on November 5, aged 40.

Associated Rayon Corp. is incorporated in Maryland with authorized capital of $40,000,000. It will be controlled through stock ownership by Vereinigte Glantzstoff-Fabricken, A. G., one of Germany's leading rayon producers.

Heavy chemical sale continues good as current year nears conclusion. Alkali materials, particularly caustic soda moving well for 1929 contract season—relief seen for tight position of acetate of lime and acetone—mercury position soft—copper sulfate sales off in November—alcohol shipments for anti-freeze moving—methanol position firm.

American synthetic fertilizers, including products of the American Cyanamid Co., have found their way in large quantities into the Japanese market, and are causing deep concern over the Japanese ammonium sulfate market.

John Arthur Wilson, Milwaukee, authority on sewage disposal, received the Chandler Medal, at a national gathering of scientists held in Havemeyer Hall, Columbia University, December 7.

Undoubtedly we will soon be hearing our neighbors over the back fence or fellow strap-hangers in the subway discussing the merits of "poh-lim'-er-ize" and "palm'-er-ize."

We would like to remind our readers of the benefits to be derived by the whole industry through the active support of the library of the Chemists' Club in New York. Already recognized as one of the best chemical libraries in the country, it is necessary that it be constantly kept up to date to maintain its usefulness. With the rapid advances in science and technology and the subsequent increase in new books and publications the job of adequately providing for the library assumes large proportions.

To accomplish the task the Chemists' Club needs the active support of the industry and its members. One of the best and easiest ways to help is to have your company send a contribution to the Library Fund, or for you to personally contribute. Another way is to donate any technical books that you may wish to dispose of. Authors of books on any subject of interest to the chemical industry should ask their publishers to send a complimentary copy to the club library.

This support of a much needed and much used source of information should be looked upon as a cooperative affair from which the whole industry benefits.

We have a little suggestion for companies who had exhibits at the Exposition of Chemical Industries at Madison Square Garden a few weeks ago. If some of the men you had at the show have not shown up yet, maybe they've got new jobs. You might find them wielding a hammer, pushing a broom, installing floodlights upside down, or doing some other *skilled* job at some exposition. They want to get rich quick, the easy way. (It's double time for overtime and it's nearly always overtime.) You exhibitors should know what we mean.

One of the most stimulating and thought-packed addresses we've come across in quite a while was that delivered by Dr. John J. Grebe of the Dow Chemical Co. to a meeting of the Society of Chemical Industry at which he was awarded the Chemical Industry Medal. Ranging from philosophy to physics in his talk, Dr. Grebe personified our idea of a research man who is practical and yet can project his thoughts into the amazing unlimited field of exploration that nature provides for us. If, by chance, you have not read "Tools and Aims of Research," a digest of Dr. Grebe's talk, we suggest that you turn back now to page 833.

PART 2: PATENTS AND TRADEMARKS

Abstracts of U. S. Chemical Patents

A Complete Checklist Covering Chemical Products and Processes

Printed copies of patents are available from the Patent Office at 10 cents each. Address the Commissioner of Patents, Washington, D. C., for copies and for general information concerning patents or trade-marks.

From Official Gazette—Vol. 554, No. 4—Vol. 555, Nos. 1, 2, 3, 4—Vol. 556, Nos. 1, 2, 3—p. 456

*Photographic Chemicals**

Photographic element and process of forming a dye image. No. 2,328,034. Virgil Sease and Otis Murray to E. I. du Pont de Nemours & Co.
Manufacture of photographic bleaching layers. No. 2,328,166. **Andre** Polgar and Charles Halmos.
Producing a multi-color photographic record on a material including a support and several silver halide emulsion layers coated thereon. No. 2,328,368. Alan Tull to Latta Syndicate, Ltd.
Color photographic element bearing at least one water-permeable colloid layer having dispersed there through an N-homophthalylamine and a reducible silver salt. No. 2,328,652. James Kirby and David McQueen to E. I. du Pont de Nemours & Co.

*Resins, Plastics**

Production of low viscosity ureaformaldehyde alcohol resin solutions. No. 2,327,984. Herbert West to American Cyanamid Co.
Providing with a hardened surface transparent sheet materials suitable for use in wind screens and windows for vehicles, including aircraft, said materials having a basis of a thermoplastic organic derivative of cellulose. No. 2,328,065. Henry Dreyfus to Celanese Corporation of America.
Polymerizing a resin-forming mono-vinyl compound in a metal mold. No. 2,328,333. Richard Freeman and Gordon Schmelter to The Dow Chemical Co.
Liquid composition comprising malodorant-free plastic polymerized chloroprene dispersed in an organic solvent. No. 2,328,351. Alexander MacDonald to B. B. Chemical Co.
Liquid composition comprising malodorant-free plastic polymerized chloroprene dispersed in an organic solvent. No. 2,328,352. Alexander MacDonald to B. B. Chemical Co.
Urea-triazine resin. No. 2,328,424. Gaetano D'Alelio to General Electric Co.
Urea-triazine resin. No. 2,328,425. Gaetano D'Alelio to General Electric Co.
Molding composition capable of being molded under heat and pressure comprising cellulose filler and a heat and pressure consolidatable condensation product of an aldehyde and a phenol and a triazine. No. 2,328,592. Gustave Widmer and Willi Fisch to Ciba Products Corp.
Polymerization of rosin and rosin esters. No. 2,328,681. Alfred Rummelsburg to Hercules Powder Co.
Producing a modified phenol-aldehyde resin. No. 2,329,045. Samuel Gutkin to Falk & Co.
Making urea-formaldehyde molding compositions and products therefrom. No. 2,329,172. Leonard Smidth.
Thermoplastic sheet material, normally non-tacky and comprising a textile base having distributed thereon a homogeneous composition of approximately 30 parts vegetable wax, 10 parts rubber, 10 parts beeswax, and 50 parts resin. No. 2,329,207. Stanley Lovell to Beckwith Manufacturing Co.
Making a resin of the alkyd type comprising producing a reaction between a polyhydric alcohol, a polycarboxylic acid, and a metallic salt of a mixture of acids derived from petroleum. No. 2,329,236. Gellert Alleman and John Perrine to Sun Oil Co.
Refining rosin products. No. 2,329,515. Richard Cox to Hercules Powder Co.
Refining hydrogenated rosin products. No. 2,329,516. Richard Cox to Hercules Powder Co.
Treatment of polymerized rosin and product obtained. No. 2,329,517. Richard Cox to Hercules Powder Co.
Refining polymerized rosin and polymerized rosin esters. No. 2,329,-566. Clell Tyler and Harold Monfort to Hercules Powder Co.
Resinous composition for wire coatings and the like. No. 2,329,583. Ansley Blades to General Cable Corp.
Treating a mass of crude oleoresin containing turpentine and a minor proportion of chips and other solid debris preliminary to the final distillation of the oleoresin to be recovered therefrom. No. 2,329,-712. Charles Gillican to Filtered Rosin Products, Inc.
Thermoplastic composition of matter comprising a polymer selected from the group consisting of polyvinyl chloride and copolymer of vinyl chloride and vinyl acetate, a plasticizer therefor, and a color stabilizer. No. 2,330,087. Leo Stage and Mortimer Harvey to Harvel Research Corp.

*Rubber**

Copolymer of vinyl chloride, vinyl acetate, and vinylidene chloride. No. 2,328,748. Winfield Scott and Raymond Seymour to Wingfoot Corp.
Making stretched rubber hydrochloride film. No. 2,328,843. Harold Osterhof to Wingfoot Corp.
Coated rubber hydrochloride film. No. 2,328,844. Harold Osterhof to Wingfoot Corp.
Rubber hydrochloride containing, in amount sufficient to inhibit photochemical deterioration, a reaction product of a di-haloethyl ether and a polyalkylene polyamine. No. 2,328,976. Albert Hardman to Wingfoot Corp.
Improved rubber isomer adhesive composition capable of adhering surfaces at atmospheric temperatures. No. 2,329,852. Herbert Reid to United States Rubber Co.

*Textiles**

Cutting fabric containing yarns of filaments or fibers of non-thermoplastic material whereby the cut edges are sealed against fraying or ravelling. No. 2,328,063. Frederick Dodge to Celanese Corporation of America.
Making a rippled composite yarn by wet spinning, at different spinning tensions, a plurality of yarns of different deniers composed of artificial cellulosic filaments. No. 2,328,074. Archibald Hunted to E. I. du Pont de Nemours & Co.
Manufacture of viscose rayon having a dry tenacity greater than 3 grams/denier and an elongation at the breaking point of less than 10%. No. 2,328,307. Gilbert Thurmond and Edward Brenner to American Enka Corporation.
Rendering textile material water repellent which comprises impregnating the material with an emulsion containing paraffin, wax, a small quantity of a fatty acid, zirconium oxychloride and a condensation product of oleyl alcohol and of several molecular quantities of ethylene oxide serving as emulsifying agent. No. 2,328,-431. Arnold Doser, Otto Bayer and Karl Hintzman to General Aniline & Film Corp.
Conditioning textile materials containing relatively high denier per filament fibers of organic derivatives of cellulose. No. 2,328,600. John Baggett to Celanese Corp. of America.
Reducing the felting and shrinking tendencies of wool containing fabrics which comprises impregnating a fabric with an aqueous dispersion of substantially unpolymerized alkylated melamine-formaldehyde condensation product. No. 2,329,622. Edwin Johnstone, Jr., and William Van Loo, Jr., to American Cyanamid Co.
Stabilizing knitted cellulose fabric against marked change in dimensions which comprises impregnating said fabric with an aqueous solution containing 8 to 15% of a water-soluble condensate of urea, formaldehyde, and an alcohol and a small amount of a strong acid-type catalyst. No. 2,329,651. Donald Powers and Russell Lawrence to Rohm & Haas Co.

*Water, Sewage and Sanitation**

Treating packing house waste water containing protein which comprises precipitating the protein by adding an acid. No. 2,328,361. Marion Sanders to Industrial Patents Corp.
Conditioning water which includes incorporating with said water for steam generation a surface-active predominantly hydrophobic organic substance. No. 2,328,551. Lewis Gunderson to Dearborn Chemical Co.
Water softening system and apparatus. No. 2,329,350. Theodore Kaysen, Jr., to The McKays Co.

Agricultural Chemicals

Bonding solid water-repellent organic parasiticidal toxicants to finely-divided carriers. No. 2,330,227. George Lynn to The Dow Chemical Co.
Insecticidal composition comprising di- (mono- chloro- phenoxy)-methane as an active toxic ingredient. An insecticidal spray comprising as active toxicants pyrethrin and di- (4-chloro- phenoxy)-methane. No. 2,330,234. Clarence Moyle to The Dow Chemical Co.
Insecticidal composition comprising di- (4-chloro- phenoxy)-methane and a phenothioxin compound as active toxicants. No. 2,330,340. Curtis Dieter, George Lynn, and Bernard Thiegs to The Dow Chemical Co.
Powder iodine compound for addition to animal feed. No. 2,331,424. Alfred Russell and Paul Witte to Tyler Laboratories, Inc.
Poultry grit comprising stone particles substantially insoluble in dilute hydrochloric acid and calcareous particles slowly soluble in dilute hydrochloric acid, both types having a coating of a calcium compound. No. 2,331,807. Vincent Shea to Allied Minerals, Inc.
Treating milk comprising heating the milk to supply latent heat of evaporation, spraying the heated milk under superatmospheric pressure. No. 2,331,895. Russell Dunmire to Buckeye Laboratories Corp.
Obtaining racemic lactic acid from zinc racemic lactate. No. 2,331,948. George Ward and Benjamin Tabenkin to Secretary of Agriculture of the U. S. of America.
Insecticide, containing methyl phenyl nitrosoamine and pyrethrum extract. Insecticide containing 2,4-diamylcyclohexanol and pyrethrum extract. No. 2,332,097. Edward R. McGovran, to the People of the United States.

* Continued from last month (Vol. 553, No. 5—Vol. 554, Nos. 1, 2, 3).

Insecticide, consisting of a powdered mixture comprising finely divided sulfur and an aluminium derivative of cresylic acid. No. 2,332,960. Edward Sydney Redvers Willmore, Francis Cooper, care of Cooper McDougall & Robertson Ltd.
Insecticide, in combination with a fertilizer, comprising a material selected from the group consisting of one or more organs of the castor plant for use as an insecticide. No. 2,333,061. Marquis Van Over to Woburn Degreasing Co.
Dialkyl esters of unsaturated dicarboxylic acids as insecticides containing a dialkyl ester of a lower aliphatic dicarboxylic acid which contains a double bond between the adjacent carbon atoms which carry the carboxyl groups. No. 2,333,666. William Moore and Richard Roblin, Jr., to American Cyanamid Co.
Method of preventing soil erosion by coating the surface of planted soil with an adhesive paint of a character that will crack without breaking the bond between the paint and the soil. No. 2,333,959. Rollin J. Smith.

Cellulose

Producing a fatty acid ester of an hydroxyalkyl cellulose. No. 2,330,-263. Aubrey Broderick to Carbide and Carbon Chemicals Corp.
Reacting lignin with hydrogen which comprises heating lignin with hydrogen under pressure in the presence of a copper oxide-containing hydrogenation catalyst. No. 2,331,154. Homer Adkins.
Production of organic acid esters of cellulose, which comprises esterifying cellulose with an aliphatic acid esterifying agent in medium which is solvent for primary ester formed and contains an alkylene cyclic di-ether. No. 2,331,964. Henry Dreyfus to Celanese Corp. of America.
Preparing a water-soluble carboxyethyl cellulose ether from cellulose which comprises reacting cellulose with an aqueous solution containing a strongly basic water-soluble hydroxide and one molecular proportion of acrylonitrile per glucose unit of the cellulose. No. 2,232,048. Louis Bock and Alva Houk to Rohm & Haas Co.
Preparing organic solvent-soluble cyanoethyl cellulose ether which comprises reacting cellulose and acrylonitrile. No. 2,232,049. Louis Bock and Alva Houk to Rohm & Haas Co.
Enhancing the colorability of natural and regenerated cellulose. No. 2,333,203. Erik Schirm to General Aniline & Film Corporation.
Cellulose material coated with a copolymer of unsymmetrical dichloroethylene and at least one different polymerizable compound containing a methylene group attached by an ethenic double bond to a carbon which is in turn attached to a negative group devoid of carbon-to-carbon unsaturation. No. 2,334,236. Harold Arnold and George Dorough and George Latham to E. I. du Pont de Nemours & Co.

Ceramics

Forming substantially clear glass having a very low content of bubbles of gaseous material, such as water vapor, carbon dioxide, sulfur dioxide and the like. No. 2,330,324. Frederick Adams to Pittsburgh Plate Glass Co.
Making a ceramic insulator, titanium dioxide containing not more than 1% by weight of basic impurities and amphoteric oxides. No. 2,330,950. Roelof Bugel to Hartford National Bank & Trust Co.
Surface treating the interior of a hollow glass article, which comprises depositing therein a quantity of sulfur, closing the article and subjecting it with the sulfur therein to an atmosphere of heat to fire the sulfur and create an acidic gas within the article. No. 2,331,-041. Burton Noble to Owens-Illinois Pacific Coast Co.
Refining molten glass by bubbling steam through a molten mass of glass and thereafter bubbling oxygen through said mass. No. 2,331,052. Hufh Shadduck to Owens-Illinois Glass Co.
Method of melting fibrous glass, which comprises depositing a plurality of long attenuated glass fibers upon a surface and causing them as they are deposited to build up into a mat. No. 2,331,145. Games Slayter to Owens-Corning Fiberglas Corp.
Forming a ceramic material having an electric resistance which varies with the amount of light impinging upon the surface of said material, containing titanium dioxide as its principal ingredient. No. 2,331,444. Eugene Wainer to The Titanium Alloy Manufacturing Co.
Producing glass fibers having roughened surfaces. No. 2,331,944. Gedeon von Pazsiczky and Hollmuth Steingraeber vested in the Alien Property Custodian.
Making artificial curled mineral fibers by providing a supply of molten glass. No. 2,331,945. Gedeon von Pazsiczky, vested in the Alien Property Custodian.
Manufacturing fibers from molten glass comprising introducing raw glass material into a melting receptacle at one end and supporting the material above the normal level of glass in said receptacle. No. 2,331,946. Gedeon von Pazsiczky; vested in the Alien Property Custodian.
Spark plug insulator made by sintering into a dense, non-porous body a ceramic mixture consisting of zircon, kyanite and alumina. No. 2,332,014. Karl Schwartzwalder to General Motors Corp.
Mat of crimped glass fibers in which the fibers extend in all directions and are interfelted and tangled to have coherence and resilience in all directions. No. 2, 332, 273. Games Slayter to Owens-Corning Fiberglas Corp.
Forming a ceramic material formed of small crystals constituting the major proportion of the structure of the material and of glass constituting a substantial proportion of the structure of the material. No. 2,332,343. Merl Rigterink to Bell Telephone Labs.
Artificial glass which comprises a sheet of light transmitting substantially rigid resin which is a copolymer of a thermoplastic resin and a resin containing in its monomeric form at least two polymerizable unsaturated organic radicals. No. 2,332,461. Irving Muskat, Maxwell Pollack and Franklin Strain and William Franta to Pittsburgh Plate Glass Co.
Production of sheet material suitable for use as light transmitting material in observation panels of aircraft and other vehicles which comprises building up on the flat polished surface of a glass plate a multilayer sheet. No. 2,332,559. Arthur Daly Philip Hawtin and Bernard Shaw to Celanese Corp. of America.
Glass solution comprising a lead borate glass in a liquid polyhydric alcohol. No. 2,333,608. Robert Wenzel to Westinghouse Electric & Manufacturing Co.
Opaque enameling or glazinc composition capable of producing a finished enamel having commercially acceptable reflectance upon firing. No. 2,334,043. Homer Staley and Ralph Danielson to Metal & Thermit Corp.
Ceramic denture material and denture or denture part formed of a fused porcelain comprising isotropic nepheline syenite. No. 2,334,-319. Reiner Erdle to Dental Research Corporation.

Chemical Specialties

Corrosion-inhibiting composition soluble in mineral oils including gasoline and in normally liquid alcohols of the type of ethyl alcohol. No. 2,330,524. James Shields to Alox Corp.
Making chewing gum containing activated carbon. No. 2,330,571. Clarence Flint to Peter Paul, Inc.
Heat-set printing ink vehicle comprising a high boiling petroleum fraction containing a pigment dispersing agent dispersed therein. No. 2,330,667. Isidor Bernstein to H. D. Roosen Co.
Pour point depressant and wax modifier consisting essentially of a condensation product of an aralkyl halide. No. 2,330,722. Eugene Lieber to Standard Oil Development Co.
Manufacturing building blocks, which comprises mixing in a cold state soil and water based to form a plastic mass, adding powdered hard asphalt, adding to said mixture asphalt of low consistency to flux the mixture of soil and asphalt. No. 2,330,747. Joseph Roediger to Standard Catalytic Co.
Steam cylinder lubricant comprising a major proportion of mineral lubricating oil, and about 0.1-2.0% of polymerized ester of an acrylic acid, plus about 1 to 15% of acidless tallow. No. 2,330,773. John Zimmer and Arnold Morway to Standard Oil Development Co.
Carrotin solution for treating fur, containing chloric acid, nitric acid, and sulfuric acid. No. 2,330,813. Carl Donner to The Chapal Donner Corp.
Lubricant comprising a mineral oil and a sulfurized high molecular weight mono-olefin polymer. No. 2,330,858. John Anderson to Standard Oil Co.
Flux composition for dip-soldering metallic members, characterized by a substantial absence of interaction with the molten solder at operating temperatures, and by a comparative freedom from vaporization, carbonization, and polymerization at such temperatures. No. 2,330,904. Mike Miller to Aluminum Co. of America.
Manufacture of sulphonated detergents. No. 2,330,922. Riewen Riegler to Allied Chemical & Dye Corp.
Preparing a solidified emulsion product, which includes providing oil of such consistency that it will be capable of forming such solidified product. No. 2,330,986. Bruce Miller, Paul Phelps and Henry Bevarly to The Girdler Corp.
Lubricant product for use where high unit pressures are combined with high rubbing speeds and high operating temperatures. No. 2,331,005. Bertrand Story and Francis Seger to Socony-Vacuum Oil Co., Inc.
Drilling wells which comprises circulating through the well bore during the drilling operation aqueous mud containing in solution a modicum of salt of green sulfonic acid. No. 2,331,049. Hans Schindler to The Pure Oil Co.
Fusible solvent free indurative composition consisting essentially of a cellulose ether, a softening plasticizer for the cellulose ether, and of a natural resin compatible in the molten state with the cellulose ether. No. 2,331,095. Roy Ritchie to The Dow Chemical Co.
Printing ink comprising as a major body or binder constituent a material selected from the group consisting of gilsonite, asphalt, and mixtures thereof. No. 2,331,194. Clarence Irion to General Printing Ink Corp.
Treating a well to remove deposits of paraffin and facilitate the production therefrom, the step which consists in introducing into the well bore a solvent mixture comprising upwards of 50 percent of cyclohexane by volume, the balance being a solvent of paraffin. No. 2,331,155. Francis Alquist to The Dow Chemical Co.
Preservation of wood and cellulosic materials which comprises treating the material with ethyl mercury pentachlorophenolate. No. 2,331,-268. Albert Flenner, Frank Kaufert and Paul Salzberg to E. I. du Pont de Nemours & Co.
Aqueous mud-laden drilling fluid for wells containing a small percentage of a viscosity-reducing compound having a substantial portion of a phosphorus acid residue, which compound is an amino-phosphate body. No. 2,331,279. Truman B. Wayne.
Aqueous mud-laden drilling fluid for wells containing a small percentage of a viscosity-reducing hydrophilic ester of a water-soluble polybasic acid. No. 2,331,280. Truman B. Wayne.
Well drilling fluid material comprising a water dispersible mud-forming base and a zeolitic cation-selective organic resinous body. No. 2,331,281. Truman B. Wayne.
Controlling the viscosity of an aqueous mud-laden well-drilling fluid subject to viscosity variations comprising, adding thereto a small proportion of a viscosity-reducing hydrophilic ester of a phosphorus acid. No. 2,331,282. Truman B. Wayne.
Improved liquid fuel composition comprising a major proportion of a hydrocarbon liquid fuel base. No. 2,331,386. Peter Gaylor to Standard Oil Development Co.
Production of composition of bituminous material and a filler comprising precipitated calcium carbonate having a particle size of the order of about 1 mu. No. 2,331,394. Sixten Hjelte.
Laundry sour consisting of sodium acid fluoride and sodium hexameta phosphate in an amount sufficient to stabilize the acid fluoride. No. 2,331,396. Ralph Humbaugh and Donald Utesch to The Speare Supply Co.
Rendering preferentially oil wettable the oil-bearing siliceous formation surrounding an oil well bore hole. No. 2,331,594. Charles Blair, Jr., to Petrolite Corporation, Ltd.
Fabricating a transparent adhesive tape which comprises frosting a surface of a sheet of regenerated cellulose, thereby lessening its transparency but increasing its surface area, and then applying directly to said frosted surface an overlying transparent pressure-sensitive adhesive coating. No. 2,331,610. Milton Kemp to The Kendall Co.

Tape which is impermeable to organic solvents including a normally dry adhesive coating responsive to highly volatile organic solvents to activate said adhesive coating to adhesiveness. No. 2,331,894. Richard Drew to Minnesota Mining & Mfg. Co.

Lubricant comprising a metal compound of the reaction product of an ester wax with phosphorus pentasulfide, disseminated in a lubricating oil. No. 2,331,923. John Musselman to The Standard Oil Company.

Clear, non-cloudy, non-milky aqueous liquid wax polish having a solids content of 10 to 15%, containing wax, higher fatty acid, rosin ammonium hydroxide, casein. No. 2,331,925. John Olson to Minnesota Mining & Mfg. Co.

Paper bag closure composed of a thread made essentially of polyvinyl alcohol extending through the wall of the bag. No. 2,331,955. Gilbert Beebe and Archie Koon to Columbian Rope Co.

Varnish for printing ink stable against separation of the binder at high atmospheric humidity conditions. No. 2,332,066. Donald Erickson and Paul Thoma to Michigan Research Laboratories, Inc.

Making lubricating materials, which comprises mixing a saponifiable material, a saponifying agent and a small amount of mineral oil. No. 2,332,202. Austin Calkins, to Standard Oil Development Co.

Abrasive article comprising abrasive grains united by a bond composed primarily of a resin formed copolymerized substances comprising an ester of an alkyl alcohol. No. 2,332,206. Loring Coes, Jr., to Norton Co.

Composite Ribbon plurality of strands of synthetic fibrous material and at least one strip of a translucent cellulosic base material. No. 2,332,233. Morris Katz.

Anhydrous, reversible grease, comprising lubricating oil, and grease-forming proportions of aluminum soap and a non-basic barium soap in which the ratio of non-basic barium soap to aluminum soap varies from 1/1 to 10/1. No. 2,332,247. Arnold Morway and John Zimmer to Standard Oil Development Co.

Making enamel comprising the steps of grinding vitrified frit intimately mixing finely divided opacifer, and heating the mixture sufficiently to merely soften the frit particles to permit the surface tension to reduce the overall size. No. 2,332,423. Carl Zwermann.

Producing titanium dioxide enamel comprising intimately mixing finely divided titanium dioxide in the anatase form with vtrified frit, and heating mixture at a temperature of approximately 1280° F. for approximately one hour. No. 2,332,424. Carl Zwermann, Jr.

Manufacturing a fluid bitumen-in-water type emulsion stable in storage and to fluctuations in temperature, additions of electrolytes and Portland cement, said emulsion owing its emulsification substantially to the reaction products of naturally occurring asphaltogenic acids and an alkali. No. 2,332,542. Vilas Watts and Paul McCoy.

Product soluble in mineral oil, having pour-depressing properties when added in small amounts to waxy mineral lubricating oils. No. 2,332,824. Philip Young to Standard Oil Development Co.

Lubricant, comprising an aromatic-free coastal mineral lubricating oil saturated fatty acid soap of an alkaline earth metal and an oil-soluble linear olefinic polymer. No. 2,332,825. John Zimmer and Arnold Morway to Jaco, Inc.

Manufacturing building blocks curtain wall blocks and floor blocks which comprises, mixing a soil with an emulsified cutback asphalt, adding a powdered hard asphalt, adding a heavy metal soap, molding the mixture into shape and subjecting to pressure. No. 2,332,-933. Joseph Roediger to Standard Oil Development Co.

Modified gel constituent of a mud-laden well drilling fluid comprising substantially the absorption-reaction product of a gel-forming constituent and an acidic dyestuff. No. 2,333,138. Truman B. Wayne.

Ink for the identification marking of fabrics, comprising a liquid in which is carried a resinous material substantially colorless and translucent and insoluble in commercial dry cleaning solvents, and an acid salt of the colorless, fluorescent basic compound, alpha phenyl meta amino benzthiazole. No. 2,333,329. John Miglarese to The National Marking Machine Co.

Preparing detergent compositions by obtaining a dry, granular composition of an alkali metal silicate and an alkali metal phosphate. No. 2,333,443. Edward Robinson to Diamond Alkali Co.

Preparing stable detergent compositions which comprises admixing anhydrous sodium tripolyphosphate with sodium metasilicate pentahydrate. No. 2,333,444. Edward Robinson to Diamond Alkali Co.

Wax impregnated glass fabric liner and gasket seal. No. 2,333,535. Ethan Lauer to Merck & Co., Inc.

Stencil correction material including a cellulose ether, a non-volatile solvent and plasticizer for said cellulose ether, a soft semi-solid filler, and a lubricant. No. 2,333,624. Ardell Altman and Everett Shaw to A. B. Dick Co.

Waterproof adhesive composition comprising an emulsion of asphalt in water, an emulsifying agent comprising a mineral colloid of the bentonite type, a small amount of oxalic acid in solution in the aqueous phase, and also containing kerosene. No. 2,333,779. Edwin Groskopf to The Patent and Licensing Corp.

Cleaning and antimist film applying article comprising a dry flexible carrier impregnated with pure sodium stearate. No. 2,333,794. Lester Jones.

Heat exchange material having a melting temperature between about 32° and 50° F. which comprises an amine selected from the group consisting of ethylene diamine and monoethanolamine and a compound dissolved therein. No. 2,333,862. Lyle Hill and Leland Short to The American Dairy Cattle Club.

Lubricant comprising in combination a major proportion of hydrocarbon oil and a minor proportion of an organo-boron ester. No. 2,333,871. Bert Lincoln and Gordon Byrkit to Continental Oil Co.

Making a compressed tablet of a mixture of particles of common salt and of calcium sulphate. No. 2,333,873. Clair Martin to Morton Salt Co.

Welding composition for the welding of white metals comprising tin, zinc, aluminum, and stearic acid. No. 2,333,989. George G. Diem.

Treatment of drilling fluids by reducing and controlling the gelatin and viscosity characteristics of an aqueous mud-laden well-drilling fluid. No. 2,334,051. Truman B. Wayne.

Lubricant for split dies comprising calcium resinate, hexachlorbenzene, and graphite. No. 2,334,076. Samuel Epstein and John Kreiser to Bethlehem Steel Co.

Stable water-color paste comprising a hardening agent capable of acidifying the composition at ordinary temperatures, a pigment, and a solution of a water-soluble alkoxyOsubstituted formaldehyde-urea reaction product in a volatile water-soluble organic solvent. No. 2,334,097. Arthur Howald and John Murray to Libbey-Owens-Ford Glass Co.

Textile finishing composition capable of imparting a full, crisp hand to textile fabrics comprising a water-dilutable aqueous emulsion of the oil-in-water type containing water, an emulsifying agent, a water-insoluble, fusible alkyd resin consisting of an alkyd resin selected from group consisting of ethylene glycol phthalate and propylene glycol phthalate. No. 2,334,107. Donald Light, Theodore Bradley, and Alden Nute to American Cyanamid Co.

Anti-corrosive composition of matter comprising predominantly nongaseous hydrocarbons containing small amounts of a polycarboxylic acid and of a mutual solvent for hydrocarbons and water. No. 2,334,158. George von Fuchs and Norman Wilson to Shell Development Co.

Stabilized grease composition comprising mineral oil, lime soap, and a stabilizing mixture consisting of castor oil and an ester of a higher fatty acid and a polyhydric alcohol. No. 2,334,239. Robert Barnett and Gus Kaufman to The Texas Co.

Gasoline-insoluble grease comprising essentially a mixture of naphtha-insoluble synthetic organic acids and the soda soap of naphtha-insoluble synthetic organic acids. No. 2,334,274. James Meadows to The Texas Co.

Water-soluble surface active amino compound having wetting, sudsing, detergent and emulsifying action in aqueous media. No. 2,334,517. Nathaniel Tucker to The Procter & Gamble Co.

Lubricant comprising a major proportion of a waxy mineral lubricating oil containing a pour depressing amount of a polymerization product of glycerol. No. 2,334,565. Eugene Lieber and Marvin Thorner, to Standard Oil Development Co.

Lubricating oil comprising in combination a major proportion of a hydrocarbon oil and a minor proportion of a derivative of an organometallic compound having at least one carbon-metal bond and containing halogen and sulfur. No. 2,334,566. Bert Lincoln to The Lubri-Zol Development Corp.

Lubricant comprising a mineral lubricating oil, a small proportion of an organic halide containing halogen in an active form corrosive to metals and a proportion sufficient to function as an anti-corrosive agent of a resinous condensation product. No. 2,334,594. John Zimmer and George McNulty to Standard Oil Development Co.

Coal Tar Chemicals

Preparation of 4-pyridine sulphonic acid. No. 2,330,641. Adolph Tiesler to Lederle Laboratories, Inc.

Obtaining resinous extracts from coal. No. 2,330,887. Ernest Higgins.

Esters of methylol phenols obtained by reacting by heating together an esterified phenol nuclearly substituted by at least one acyloxymethyl group of not over eight carbon atoms and a drying oil fatty acid until the original acyl group of the said acyloxymethyl group has been substantially replaced. No. 2,331,169. Herman Bruson to The Resinous Products & Chemical Co.

Preparing oil-soluble phenolic condensation products which comprises heating an alkyl phenol having an alkyl group of at least 3 carbon atoms with a methanol-free aqueous solution containing dissolved formaldehyde and melamine. No. 2,331,744. Robert Swain and Pierrepont Adams to American Cyanamid Co.

Manufacture of synthetic phenol involving sulfonation of benzene, conversion of benzene sulfonic acid to sodium benzene sulfonate, fusion of sulfonate with sodium hydroxide, separation of sodium phenolate thus formed from fusion mass and recovery of phenol therefrom. No. 2,334,488. John Harris, Jr., and Norman Wroby and William Brown to Allied Chemical & Dye Corp.

Recovering phenolic compositions from granular pre-dried whole spent liquor solids obtained from spent pulp cooking liquors. No. 2,334,-620. Edward Goodell.

Coatings

Forming upon an object a coating comprising crystalline synthetic linear polyamide having a molecular weight above 3,000 and, as a heat-stabilizing agent therefor, a fusible, non-heat-hardening phenol-formaldehyde resin. No. 2,330,333. Merlin Brubaker to E. I. du Pont de Nemours & Co.

Air-drying coating composition comprising an oil modified alkyd resin as the sole film-forming ingredient and an aliphatic unsaturated ketone having a carbonyl group conjugated with an ethylenic double bond. No. 2,330,337. Martin Cupery to E. I. du Pont de Nemours & Co.

Manufacture of calcium carbonate-adhesive coatings. No. 2,330,428. Ausker Hughes, Harold Browne, and Howard Roderick to Wyandotte Chemicals Corp.

Oxidizing catalyst capable of oxidizing carbon monoxide at temperatures materially lower than any of its constituents. No. 2,330,664. Owen Bennett and Alfred Van Andel to Carbon Monoxide Eliminator Corp.

Forming a sound record and a picture record in sound and picture zones respectively which comprises coating one zone with a solution in which the lacquer coating is insoluble. No. 2,330,796. Charles Bennes to Technicolor Motion Picture Corp.

Protective phosphate coating for application to metallic surfaces to activate the surfaces to provide for subsequent rapid formation of uniform, fine crystalline coatings of phosphates when the surfaces are subjected to phosphate solutions. No. 2,331,196. George Jernstedt and John Lum to Westinghouse Electric & Mfg. Co.

Luminescent coating for electric lamps. No. 2,331,306. Ezio Casellini to Sylvania Products Inc.

Roofing granules, each granule of which has a surface coating composed of partly fused granule particles and completely fused granule particles. No. 2,331,357. George Swenson to Minnesota Mining & Manufacturing Co.

Undercoat composition consisting of solvents, a flexible, metal-adherent binder, and pigments in the fine, deflocculated, fully-wetted condition of the pigment of an enamel. No. 2,331,544. Loy Engle to Interchemical Corp.

Extraction of vegetable proteins from a vegetable material. No. 2,331,619. Earle Morse to Reynolds Research Corporation.

Artificially colored decorative roofing granules comprising dense, refractory quartzitic base granules coated with a fused weather-resistant non-blooming glaze coating of green color. No. 2,331,868. George Swenson to Minnesota Mining & Manufacturing Co.

Producing a coating comprising a pebbled surface which is substantially continuous, by producing a composition containing resin and vegetable drying oil, adding a gasefying material and subjecting a surface to heat. No. 2,332,031. Harry Toulmin, Jr., to The Commonwealth Engineering Co. of Ohio.

Protectively treating fresh fruit with a soap-containing emulsion of waxy material, while employing a naturally hard water in the emulsion bath. No. 2,332,128. Irvin Joyn Blondon, to Brogdex Co.

Grease-proofing porous materials, comprising applying to surface of materials a film of water soluble adhesive and applying a viscose film to sid adhesive film to form and intermediate layer of a cellulose compound. No. 2,332,169. Albert Robbins.

Comprising a prolamine and graphite, said coating being adapted to reduce the friction between airplane, and air. No. 2,332,196. Johan Bjorksten, to Johan Bjorksten.

Making roofing and siding comprising providing a base, applying a coating of molten asphalt preparing a mixture comprising metallic flakes and finely divided particles of meltable adhesive agent, applying said mixture to the hot asphalt. No. 2,332,219. Norman Harshberger to Carbide and Carbon Chemicals Corp.

Building material comprising a base, material on said base, and a weather exposed protective layer comprising discrete overlapping hard mica flakes bonded to an masking coating in the portion exposed to the weather. No. 2,332,221. Norman Harshberger, to Carbide and Carbon.

Coating a damp mineral aggregate and bonding the damp mineral aggregate. No. 2,332,260. Joseph Roediger, Standard Catalytic Co.

Colored mastic flooring composition by weight 208 parts of an emulsified residual asphalt, 112 parts of a slaked hydrated dolomitic lime, 1700 parts of river bank sand and about 50 parts of a pigment per ton. No. 2,332,311.

Manufacture of flexible transparent, self-supporting sheet material, having a reticulated base embedded within a transparent film. No. 2,332,373. George Dorough and George Latham to E. I. du Pont de Nemours & Co.

Coating a conductor which comprises preheating a conductor, heating ethyl cellulose plastic, coating the conductor with the heated ethyl cellulose plastic. No. 2,332,538. Howard Smith.

Making coated abrasives, comprising coating a waterlaid cellulose web with a viscous synthetic resinous combining adhesive. No. 2,333,-034. Nicholas Oglesby, Charles Reilly and Victor Gilbert to Behr Manning Corp.

Protectively coating comestible products having a relatively firm and continuous surface, which consists of providing such products with a readily removable nonadherent continuous film-like transparent envelope by applying thereto a concentrated colloidal solution of rubber particles dispersed in an aqueous medium. No. 2,333,887. Lorenz Redlinger.

Coating method of treating metal to form metal powder. No. 2,334,-258. Frank Gavin to Crown Cork & Seal Co. Inc.

Dyes, Stains

Dye intermediate containing two monovalent nuclei capable of reacting to form a dye. No. 2,330,291. James Kirby to E. I. du Pont de Nemours & Co.

Azo dye obtainable by coupling a tetrazotized aromatic di-primary-aminoazo compound of the general formula $NH_2(R').N = N.(R'')NH_2$. No. 2,330,908. Henry Olpin and Edmund Stanley to Celanese Corporation of America.

Manufacture of o-hydroxy azo dyestuffs consisting in coupling a member of the group consisting of diazotized 2-amino-1-phenols substituted by a member of the group consisting of halogen and nitro and diazotized 2-aminobenzene-1-carboxylic acids with a hydroxynaphthalene sulfonic acide amide, coupling in o-position to the hydroxy group. No. 2,331,278. Achille Conzetti and Guido Schetty to J. R. Geigy A. G.

Producing colored granular material by affixing to a base granule a stable, substantially permanent color bearing inorganic bond. No. 2,331,356. George Swenson to Minnesota Mining & Manufacturing Co.

Producing colored granular material by affixing to a refractory siliceous base granule a stable, substantially permanent color bearing inorganic bond. No. 2,331,358. George Swenson to Minnesota Mining & Manufacturing Co.

Water-insoluble azo dyestuffs yielding, when produced on fiber, vivid yellow dyeings of very good fastness properties, particularly of very good fastness to light and to washing. No. 2,331,812. Norbert Steigel and Fred Haarde to American Aniline Products, Inc.

Azo dyestuff intermediates havng formula CH3CO CH2CONHRX in which R is saturated hydrocarbon radical, and X is member of group consisting of SO3H and its salts. No. 2,332,388. Nel Machenzie, to American Cyanamid Co.

Preparing a merocyanine dye containing a selenocarbonyl group. No. 2,332,433. Leslie Brooker and Robert Sprague to Eastman Kodak Co.

Cyanine Dyestuff Intermediates. No. 2,332,517. John Kendall to Ilford Limited.

Increasing the fade resistance of a design formed of a water and alcohol soluble dye which is susceptible to fading in sunlight, which method comprises applying a composition comprising bentomite, water and a liquid which is more volatile than water to said design. No. 2,332,696. William Champion Ditto Inc.

Dyestuffs of the anthroquinone series consisting of 4,4-di-(toluidino)-1,1'-dianthrimide sulfonic acid and 4,4'-di-(xylidino)-1,1'-dianthrimide sulfonic acid their alphanitro- and alphamino-substitution derivatives and the alkali metal salts of such sulfonic acids. No. 2,332,779. Edwin Bauxbaum, to E. I. du Pont de Nemours & Co.

Acid wool dyestuffs. No. 2,333,137. Werner Zerweck and Ernst Heinrich to General Aniline & Film Corp.

Diphenylamine dye containing a nitro group as the sole chromophore, and having directly attached to one of the benzene nuclei of the diphenylamine a hydroxyalkylamino radicle of which the hydroxyl group is esterified to an acid ester of an acid of phosphorous. No. 2,333,159. Henry Dreyfus to Celanese Corp. of America.

Production of discharge effects on an azo dyed material comprising yarns of an organic derivative of cellulose. No. 2,333,204. George Seymour and George Ward to Celanese Corp. of America.

Acid wool dyes of the phenylaminoanthraquinone sulfonic acid class which carry the group—CF_3 directly attached to the phenyl ring and which carry a sulfonic acid group in phenyl ring. No. 2,333,402. Alexander Wuertz, Henry Lee, and Edwin Buxbaum, to E. I. du Pont de Nemours & Co.

Manufacture of stilbene dyestuffs. No. 2,333,427. Ernst Keller to J. R. Geigy A. G.

Equipment

Method and apparatus for concentrating liquids which upon concentration deposit crystals and leave a residual concentrated liquor. No. 2,330,221. Martin Kermer to Buffalo Foundry & Machine Co.

Apparatus for dispensing hypochlorites. No. 2,330,328. Walter Bachman.

Electrolytic alkali chlorine cell. No. 2,330,404. Samuel Burns and Martin Chesterfield to Hooker Electrochemical Co.

Electrolytic alkali chlorine cell. No. 2,330,415. John Flynn and John Ingersol to Hooker Electrochemical Co.

Electropolishing apparatus. No. 2,330,562. Folsom Drummond and David Bench to The Himmel Brothers Co.

Aluminum furnace. No. 2,330,576. Georg Hagerup-Larssen.

Dry cell containing a chloride electrolyte gelatinized by lignin residue of saccharification of vegetable matter. No. 2,330,607. Richard Muller and Harry Lee.

Photovoltaic cell and method of manufacturing the same. No. 2,330,620. Ernst Presser.

Plant for recovery of volatile oil and grease solvents. No. 2,330,655. Jacques Zucker.

Process and apparatus for dialyzing latex. No. 2,330,672. Hendrik Braak to P. Honig.

Scanning type electron microscope comprising means for forming an undeviating electron beam. No. 2,330,888. James Hillier to Radio Corporation of Amreica.

Scanning type of electron microscope. No. 2,330,930. Richard Snyder, Jr., to Radio Corp. of America.

Device for analyzing a continuous supply of gaseous matter comprising means for ionizing particles of said matter, a current collector, means for periodically focusing ionized particles having mass to charge ratios within a predetermined range of values in a predetermined sequence on said current collector. No. 2,331,189. John Hipple, Jr., to Westinghouse Electric & Mfg. Co.

Device for continuously analyzing a gaseous atmosphere subject to change in composition comprising means for supplying a continuous sample of said atmosphere, means for ionizing particles of said sample, a current collector, means adjustable to selectively focus ionized particles of each of a plurality of predetermined masses on said current collector. No. 2,331,190. John Hipple, Jr., to Westinghouse Electric & Mfg. Co.

Liquid carbonating device for use in combination with a supply of liquid under pressure and a tank of CO_2 gas. No. 2,331,248. Frank Towle and Edward Gamble.

Viscosimeter. No. 2,331,284. Herman Albertine to Rogers Products Co. Inc.

Making an electrographitic brush which comprises forming shapes from a mixture of carbon, carbonaceous binder, and at least one finely divided hard metal carbide. No. 2,331,479. Walter Krellner to Stackpole Carbon Co.

Apparatus for the electrical treatment of colloidal dispersions. No. 2,331,494. Edward Murphy, Wylde Green, and Frederick Paton and John Ansell, to Dunlop Rubber Co. Limited.

Oil extraction process for cellular oil-bearing materials having gelatinous constituents. No. 2,331,785. Frank Lachle to The Schwarz Engineering Co. Inc.

Apparatus for reclaiming rubber scrap by means of high pressure steam. No. 2,331,836. Jakob Hirschberger.

Melting furnace for melting light alloys wherein the products of combustion do not contact the surface of the metal. No. 2,331,887. Walter Bonsack to The National Smelting Co.

Sealing a catalyst chamber in which a chemical reaction is being effected at a pressure other than atmospheric and through which a mass of finely divided catalyst is being continuously fed simultaneously with the continuous passage therethrough of vaporous reactants. No. 2,331,938. August Schutte to The Lummus Co.

Furnace for the separation of a metal alloyed with other metals, which employs an alloying agent for extracting a component metal from a raw alloy or mixture. No. 2,331,988. Hirsch Loevenstein to Independent Aluminum Corp.

Packing for fractionating columns. No. 2,332,110. Walter Podbielniak to Benjamin Schneider.

Incandescent electric lamp, comprising a bulb, a mount with a filament disposed in bulb and leads projecting therefrom, and basing cement enveloping portions of said leads and comprising a mixture of thermo-setting phenol furfural resin, 300 mesh aluminum powder, and alcohol sufficient to form workable paste. No. 2,332,116. Edward Robert Schmid, to Westinghouse Electric and Manufacturing Co.

Distillation apparatus for the refining of heat-sensitive hydrocarbon oils. No. 2,332,215. Edward French.

Apparatus, for bringing a gas into contact with a liquid. No. 2,332,224. Sheldon Heath and William Schambra Blaw-Knox Co.

Transportation of caustic soda. No. 2,332,242. Robert MacMullin to The Mathieson Alkali Works, Inc.

Distilling apparatus, for conditioning sea water for drinking purposes. No. 2,332,294. Benjamin Bohmfalk.

Apparatus for dextrinizing starch by the dry roasting method. No. 2,332,345. William Rowe and Carl Hagen to Corn Products Refining Co.

Apparatus for carrying out chemical reactions comprising a time tank having only two openings. No. 2,332,627. Frederic Pyzek.

Fluid density indicator. No. 2,332,807. Thomas Moore to Standard Oil Development Co.

Plant for the preparation of hydrogen under high pressure. No. 2,332,915. Georges Francois Jubert.

Furnace for making carbon determinations in the analysis of steel. No. 2,332,943. Winfield Sobers to Hevi Duty Electric Co.

Apparatus for indicating and adjusting the specific gravity of suspensions. No. 2,332,953. Klaas Tromp.

Light-polarizing device comprising, a transparent supporting element, providing a dichroic light-polarizing surface comprising an exceedingly thin film of a plastic of the class consisting of polyvinyl alcohol and polyvinyl acetal. No. 2,332,958. Cutler West to Polaroid Corporation.

Apparatus for hot dip coating of metals. No. 2,332,978. Frank Ahern.

Electric storage battery, which consists in a positive pole plate grip consisting essentially of an alloy of lead, silver and antimony, whereby corrosion of the grid is minimized. No. 2,333,072. Lester Lighton to Electric Storage Battery Co.

Laboratory heater for rapid evaporation, drying and charring of laboratory specimens. No. 2,333,683. Jacob Ascher Schuldiner.

Fractionating column adapted to fractionate vapors evolved in boiling a mixture of ingredients having different boiling points. No. 2,333,712. Eddy Eckey to The Procter & Gamble Co.

Apparatus for developing photographic sensitized layers by moist ammonia or other vapour. No. 2,333,733. Sydney Morse to Wood, Mallabar & Co. Ltd.

Printing roll comprising a core surfaced with a resilient, rubber-like, oil-resistant layer of substantial thickness comprising the product of vulcanization under heat of a composition containing alkyd resin, a plastic polymer of chloroprene and vulcanizing agent. No. 2,333,800. Robert Lewis and Albert Weiss to Vulcan Proofing Co.

Apparatus for removing residual solvent from solids which have been extracted by means of a volatile solvent. No. 2,334,015. Arthur Levine, Orland Sweeney, Charles Kircher, Jr. and William McCracken, to E. I. du Pont de Nemours & Co.

Glass-to-metal seal comprising an iron body, a glass body, a film of silver between the surfaces of said bodies, and layers of iron oxide between the silver film. No. 2,334,020. Henry Miller and John Spooner to Radio Corp. of America.

Apparatus for forming a seamless pipe or coating from plastic mixture of fibrous material and a binder. No. 2,334,027. William Postlewaite to Standard Oil Co. of California.

Mercury cathode cell. No. 2,334,354. Chester Richardson to The Mathieson Alaki Works, Inc.

Cathode-Ray tube. No. 2,334,516. Constantin Szegho to The Rauland Corp.

Oil preheating furnace and fractionating equipment adapted to condense and separate hydrocarbon vapors into separate liquid products. No. 2,334,555. Frank Howard to Standard Oil Development Co.

Recovery of nitrogen and oxygen, apparatus for rectifying air into substantially pure nitrogen and oxygen. No. 2,334,632. Franz Koehler.

Explosives

Manufacturing nitrogen derivatives of carbon compounds from a mixture of highly heated cracked products. No. 2,331,968. William Forney to Cities Service Oil Co.

Explosive comprising nitrostarch, barium nitrate, coal dust, aluminum powder, dry dicyandiamid, graphite and paraffin. No. 2,333,275. Walter Snelling to Trojan Powder Co.

Preparing starch-water soluble nitrate explosive compositions. No. 2,333,637. Claude Carey to Atlas Powder Co.

Explosive comprising a porous condensation product of urea and formaldehyde and an explosive compound contained within its pores. No. 2,334,149. Kurt Ripper to American Cyanamid Co.

Food Chemicals

Process for purifying wort in the manufacture of beer. No. 2,331,556. Hans Lindgren to The DeLaval Separator Co.

Production of preserved fruit products, by treating the fruit products with a syrup produced by the acid conversion of starch to provide a conversion liquor. No. 2,331,804. Karl Seulke to A. E. Staley Manufacturing Co.

Extracting sugar from sugar beets. No. 2,332,062. Thomas Cutler.

Stable plastic shortening fat mix comprising about equal parts by weight of a shortening fat melting at 115° to 120° F. and a hydrogenated vegetable oil melting at 140° to 160° F. and dispersed therein dry disrupted starch grains. No. 2,332,074. Enoch Griffith to The Griffith Laboratories, Inc.

Protecting whole fruit from decay, comprising the step of contacting the fruit with an equeios solution containing .3% to 3.0% chlorine and an alkali metal salt of a sulphated anionic surface active agent. No. 2,332,151. Arthur Kalmar to Food Machinery Corp.

Production of a thermophylic free starch. No. 2,332,320. Ralph Kerr to Corn Products Refining Co.

Extracting zein from gluten meal with alcoholic solvent at elevated temperature and recovering zein from solution. No. 2,332,356. Lloyd Swallen and Martin Hamilton to Corn Products Refining Co.

Dry, water-soluble, substantially non-hygroscopic and stable beverage-forming mixture comprising an acid substance selected from the group consisting of citric, tartaric and malic acids and their acid salts, and an edible, essentially non-hygroscopic and relatively water-insoluble acid phosphate. No. 2,332,736. Frank Lyons to Clyde Collins Inc.

Making a starch conversion product containing a large proportion of reducing sugar and having an abnormally low ash content. No. 2,332,758. Herman Schopmeyer and Abraham Goodman American Maize-Products Co.

Making a dry, powdered coffee extract. No. 2,333,027. Max Rudolf Morgenthaler, to Inredeco Inc.

Preparing candy coated puffed cereal which comprises candy solution containing cane sugar, honey, acetic acid and sodium acetate. No. 2,333,442. James Rex to Ranger Joe, Inc.

Sterilization and preservation of spices. No. 2,333,505. Hugh Allen, one-half to Albert McCaleb.

Treating solid food material having a fibrous cell structure containing substantial amounts of water. No. 2,333,850. Melville E. Dunkley.

Promoting growth of yeast which comprises incorporating growth promoting factor 11B into a wort containing a Saccaromyces cerevisiae yeast and carbamid as a nitrogen source. No. 2,333,955. Alfred Schultz and Lawrence Atkin and Charles Frey to Standard Brands Inc.

Production of yeast, which comprises propagating a Saccharomyces cerevisiae yeast under aeration, in a nutrient medium containing a yeast assimilable carbohydrate, a yeast nourishing inorganic salt, growth promoting factors inositol, beta alanine, 11B, 2-methyl-5-ethoxy methyl-6-amino pyrimidine and 4-methyl-5-B-hydroxy ethyl thiazole. No. 2,333,956. Alfred Schultz and Lawrenc Atkin to Standard Brands Inc.

Preparing pre-cooked dried foodstuffs. No. 2,334,059. Hans Bauer and Elmer Glabe to Stein, Hall Manufacturing Co.

Electrolytic process for treatment of whole distillery slop. No. 2,334,063. Charles J. Brockman.

Refining sugar which comprises subjecting said sugar to the action of an organic peracid. No. 2,334,126. Joseph Reichert and Roy Secord to E. I. du Pont de Nemours & Co.

Making liquid coffee extracts which comprises mixing a ground or comminuted substance to be extracted with a moisture absorbing inert substance to permit expansion. No. 2,334,171. Clinton W. Carter.

Goldbeater's foil, a metal beating packet of layers of material adapted to receive metal foils said material comprising cellulose acetate and tricresyl phosphate plasticizer. No. 2,334,230. Donald Swift to M. Swift & Sons, Inc.

Edible jelly composition, containing a soluble pectin and an edible salt of a metal of the group consisting of calcium and magnesium and having a sugar concentration of less than approximately 30% by weight of the gel component of the finished jelly. No. 2,334,281. Aksel Olsen and Ellis Fehlberg to General Foods Corp.

Method of preparing a lecithinated food product in the form of a dry granular mass. No. 2,334,401. William Fitzpatrick and Harold Wagner to The W. J. Fitzpatrick Co.

Production of peptizing agent by dissolving casein in water which comprises adding substantially dry casein to water in presence of a substance selected from class consisting of neutral soluble salts of phthalic acid, substituted derivatives of phthalic acid, phthalimide, substituted derivatives of phthalimide, naphthalic acid, maleic acid, succinic acid, and succinimide. No. 2,334,607. Edward Christopher to Industrial Patents Corporation.

Industrial Chemicals—Inorganic

Producing antimony from anitmony trioxide. No. 2,330,307. Charles O'Keefe.

Treating foundry sands which consists in mixing therewith a small amount of a mixture comprising iron oxide, chromium oxide, aluminum oxide, metallic aluminum, and carbon. No. 2,330,418. Joseph Gitzen.

Synthesizing hydrogen chloride and effecting immediate absorption of the hot product to produce aqueous hydrochloric acid of commercial concentration. No. 2,330,440. Aylmer Maude to Hooker Electrochemical Co.

Regenerating a solid catalyst contaminated with a carbonaceous deposit. No. 2,330,462. Jack Weiland to Universal Oil Products Co.

Recovering pyrite and coal values from a low grade coal containing pyrite. No. 2,330,479. Stephen Erickson to Chemical Construction Corp.

Active platinum catalyst comprising a wire gauze. No. 2,330,539. Ruland Auchter, vested in the Alien Property Custodian.

Dewatering of suspended solids. No. 2,330,542. August J. Barnebl, Howard Grant and August C. Barnebl to Swenson Evaporator Co.

Cyclic process of making ferric oxide from nitric acid solutions. No. 2,330,553. Benjamin Butler.

Method and device for separating solid substances from suspensions. No. 2,330,589. Fredrik Juell.

Manufacturing sulphurous anhydride alumina and cements using sulphates of calcium. No. 2,330,631. Jean Seailles.

Regeneration of an adsorbent catalyst by the combustion of contaminating material deposited thereon. No. 2,330,710. Charles Hemminger to Standard Oil Development Corp.

Catalyst regeneration. No. 2,330,767. Albert Welty, Jr., to Standard Oil Development Co.

Regulating the refrigeration of finely divided material to a predetermined uniform temperature, consisting in establishing a flow of fluid refrigerant. Reissue No. 22,383. Original No. 2,266,292. Gerald Arnold.

Precipitated magnesium basic carbonate comprising a majority of particles of roughly spherical or oblate spheroid type. No. 2,330,836. Lewis Miller to Keasbey & Mattison Co.

Recovering phosphate from boiler sludge containing phosphate and alkaline earth metal. No. 2,330,865. Edward Butzler to Hall Laboratories, Inc.

Dispersing a flotation reagent throughout a pulp of solid particles and a liquid medium, preparatory to selective separation of constituents forming the solid particles of the pulp. No. 2,330,875. Edward Ellis and John Pamplin to Southern Phosphate Corp.

Developing fire and shock resisting bond in silica-alumina refractories, which comprises maintaining percentages of fluorine and B_2O_3 in the composition during desired parts of the firing period. No. 2,331,232. Donald Ross.

Purification of salt solutions wherein acid sludge derived from the acid treatment of petroleum hydrocarbons is reacted with a base having a cation selected from the group consisting of potassium, sodium, calcium and ammonia. No. 2,331,235. Jan Ruys, Russell Kittle, Frank Heath and William Dietz to Shell Development Co.

Production of improved supported catalysts comprising heating an alumina of the class consisting of the hard stony, crystalline alumina scale. No. 2,331,292. Raymond Archibald and Albert Smith to Shell Development Co.

Continued reuse of a depilatory in de-hairing edible carcasses to improve their marketability. No. 2,331,364. Gene Abson to Chicago Testing Laboratory, Inc.

Continued reuse of a depilatory in de-hairing edible carcasses to improve their marketability. No. 2,331,364. Gene Abson to Chicago Testing Laboratory, Inc.

Reconditioning a solid heat liquefiable depilating material for edible animal carcasses which comprises adding thereto a petroleum residue. No. 2,331,365. Gene Abson to Chicago Testing Laboratory, Inc.

Condensation product salts which are liquid to solid substances soluble in water to form solutions which are decomposed by boiling or by treating with alkalies, water-insoluble compounds being formed. No. 2,331,387. Charles Graenacher, Richard Sallmann, and Otto Albrecht to Society of Chemical Industry in Basle.

Obtaining chlorine by taking an aqueous solution of chloride salt, converting it into a vapor or mist, blowing said vapor or mist in a confined passage while producing a disruptive spark whereby chlorine gas is separated from said vapor or mist. No. 2,331,402. William C. Leete.

Preparing an alkaline earth metal phenoxide of an alkyl phenol sulfide. No. 2,331,448. Carl Winning and Louis Mikeska to Standard Oil Development Co.

A catalyst comprising a synthetic siliceous initially zeolitic material containing fluorine. No. 2,331,473. Julius Hyman to Velsicol Corp.

Titanium oxide production, a process for hydrolyzing a titanium sulfate solution. No. 2,331,496. Carl Olson to E. I. du Pont de Nemours & Co.

Calcium sulfate production, a pigment-useful, insoluble anhydrite substantially stable and resistant towards hydration. No. 2,331,515. Roy Sullivan to E. I. du Pont de Nemours & Co.

Manufacturing a composite catalytic particle consisting of non-metallic catalytic core and an enveloping metallic sheath. No. 2,331,521. Ernest Utterback to Socony-Vacuum Oil Co. Inc.

Testing for a sulphanilyl compound in a body fluid. No. 2,331,573. Abraham Sheftel.

Preparing an alkali halide for capsulation withon a gelatin capsule. No. 2,331,598. Robert Cook and Sereck Fox to Gelatin Products Co.

Production of zinc oxides of acicular habit, the improvement which comprises introducing zinc vapor substantially free of zinc oxide fume and oxidizing gases into a well defined combustion zone. No. 2,331,599. Howard Cyr to The New Jersey Zinc Co.

Reconditioning a contaminated aqueous alkali metal hydroxide solution containing a solutizer for weak organic acids and also containing contaminants. No. 2,331,622. Alan Nixon and Orris Davis to Shell Development Co.

Making dibenzoyl sulfide in aqueous medium which comprises reacting benzoyl chloride with sodium sulfide in cold concentrated aqueous solution containing in addition a wetting agent and a basic sodium buffer salt sufficient to keep the pH above about 6.0 during the reaction. No. 2,331,650. Edward Blake to Monsanto Chemical Co.

Monosubstituted cyanamide. No. 2,331,670. Walter Ericks and Paul McClellan to American Cyanamid Co.

Preparing monoalkylol cyanamides. No. 2,331,671. Walter Ericks to American Cyanamid Co.

Hydrogenation catalyst comprising an inert, granular, substantially non-porous refractory support material, the particles of which are uniformly coated with an adherent deposit of noble metal oxide. No. 2,331,915. William Kirkpatrick to Hercules Powder Co.

Producing copper sulfide from metallic copper and elemental sulfur comprising contacting metallic copper and finely divided sulfur in an acid aqueous solution of a salt of the sulfates and chlorides of the alkali and alkaline earth metals, magnesium copper and iron. No. 2,332,145. John Hay, to The Harshaw Chemical Co.

Production of alkali metal chlorites, by absorbing chlorine dioxide in an aqueous solution containing hydrogen peroxide and an alkali metal bicarbonate. No. 2,332,180. Edward Soule, to Mathieson Alkali Works.

Production of chlorine dioxide, the improvement which comprises reacting a metal chlorate with a mineral acid of pH not exceeding 1 and hydrogen peroxide at a temperature not exceeding 70° C. No. 2,332,181. Edward Soule, to The Mathieson Alkali Works.

Producing individual mica flakes coated on all surfaces comprising mixing individual mica flakes, resinous binder of fusible character. No. 2,332,220. Norman Harshberger to Carbide and Carbon.

Cement composition comprising essentially a high aluminate cement and mica schist. No. 2,332,222. Norman Harshberger to Carbide and Carbon.

Producing a ceric oxide of superior opaquing properties in vitreous enamels comprising calcining a cerium oxide, NaOH and a phosphate. No. 2,332,236. Harry Kremers, Lester Bateman The Harshaw Chemical Co.

Preparing solutions of aluminum sulfate having a basicity between 32 and 34. No. 2,332,285. William Wilson to Monsanto Chemical Co.

Determining amount of sodium hydroxide in a solution containing alkali metal salts of weak acids and contaminated with sodium aluminate. No. 2,332,497. Perle Burkard to Wyandotte Chemicals Corp.

Double salt of an alkali metal borate and an alkali metal salt of riboflavin. No. 2,332,548. Morris Eli Auerbach to Winthrop Chemical Company.

Converting sulfur dioxide to a sulfate radical in the form of ferric sulfate. No. 2,332,647. Harmon Keyes.

Producing dispersible sulfur in powder form. No. 2,332,934. David Rolo Ronald McIntyre, and Edward Sydney to Cooper, McDougall & Robertson Ltd.

Recovering sodium sulfate from a natural deposit thereof also containing other substances. No. 2,333,138. Charles D. Adams.

Water softening process which comprises passing water containing dissolved cations from one material in contact with sulfonated rubber containing cations from another material. No. 2,333,142. Abraham Behrman to Infilco Incorporated.

Preparing a product having utility in the laboratory which comprises impregnating air dry sandstone with a homogeneous dispersion of a water saturated, mineral acid catalysed furan mixture, and resinifying the furan in situ by subjecting the impregnated sandstone product to a heat treatment. No. 2,333,151. James Campbell to Kewaunee Manufacturing Co.

Method for recovering, in the form of a concentrated solution, substances suspended in gases containing vapours of a solvent for said substances. No. 2,333,193. Alef Persson and Johan Naucler.

Separating potassium chloride and borax and recovering potassium chloride and borax from hot solutions. No. 2,333,334. Edward Pearson to American Potash & Chemical Corp.

Separating substances of different specific gravities by the sink-and-float method. No. 2,333,347. Frederick Trostler to The Sink and Float Corporation.

Dental investment material comprising calcium sulfate binder, feldspar, and silica grog. No. 2,333,430. Pyungtoo Lee and Charles Dietz to The Dentists' Supply Co. of New York.

Abrasive article impregnated with a filler comprising sulfur and chlorinated diphenyl. No. 2,333,480. Luther P. Jackson.

Carrying out a catalytic reaction in the presence of hydrogen, the method of preventing the injurious superheating of hot regenerated catalyst having property of exhibiting a substantial rise in temperature on contact with hydrogen. No. 2,333,500. Albert Welty, Jr., to Standard Catalytic Co.

Surface mirror comprising a body of dielectric material, a three layer compound metallic reflecting film comprising a primary coating of oxidized nickel formed on surface and bonded there to an intermediate coating of nickel on primary coating and an outer deposit of electrolytically precipitated rhodium. No. 2,333,534. Harold Lang to Sigmund Cohn & Co.

Utilizing waste ferrous sulfate by transposing the SO_4 radical of this compound and forming therewith a sulfate compound of substantial commercial value. No. 2,333,672. Thomas Oliver, and Ralph Long and Leo Crosson to Charlotte Chemical Laboratories, Inc.

Liquefying dry chlorine gas contaminated with small quantities of sulfuric acid. No. 2,333,748. Luke Sperry to Hercules Powder Co.

Gas analysis determining the sodium content of a gaseous dispersion. No. 2,333,762. Louis Bertrand.

Transferring heat from an exothermic reaction zone to an endothermic reaction zone disposed out of heat conductive relationship with the exothermic zone. No. 2,333,845. Joseph Danforth to Universal Oil Products Co.

Pressure regulation. No. 2,333,905. Charles Watson to Universal Oil Products Co.

Stabilized bleach bath comprising an aqueous solution of a peroxygen compound having a pH of at least 11.5 and containing an alkali metal pyrophosphate and a soluble magnesium salt as the stabilizing agent. No. 2,333,916. Donald Campbell and William Loftus to E. I. du Pont de Nemours & Co.

Manganese electrolyte purification. No. 2,334,210. Karl Leute to Electro Manganese Corp.

Composition of matter for neutralizing noxious gases liberated upon firing of explosives in mining and like operations, comprising a mixture containing magnesium oxide and an ammonium salt. No. 2,334,255. Harrie Dod and John Lewis, to T. S. Nettlefold & Sons Proprietary Ltd.

Abrasive article containing abrasive grains comprising diamonds and a vitrified glass bond containing B_2O_3, Na_2O, and Al_2O_3. No. 2,334,266. Henry Houchins to The Carborundum Co.

Preserving Lime. No. 2,334,499. Harry E. Millard.

An abrasive article comprising abrasive material and a bond comprising synthetic elastomer copolymer including butadiene and acrylic nitrile, an organic liquid solvent for said copolymer and a thermoplastic resin which will react with said solvent and form a thermosetting resin. No. 2,334,526. Hugh Allison to The Allison Co.

Removal of sulfur compounds from mineral oil fractions. No. 2,334,549. George Gilbert to Standard Oil Development Co.

Producing a blocking layer device on a conducting base, which method comprises depositing selenium containing a halogen on said ase from a vapor directly to the crystalline state, depositing on said layer a layer of halogen-free selenium in vitreous form, converting said last-named layer into crystalline form, and thereafter producing a blocking layer on the last-named layer. No. 2,334,554. Clarence Hewlett to General Electric Co.

Apparatus for recovering anhydrous sodium sulphate and similar substances. No. 2,334,563. Irvin Lavine and Robert Schultz to North Dakota Board of Higher Education.

Antioxidant composition, a redwood tar distillate obtained by destructively distilling in a partial vacuum and at a temperature not exceeding 350° C. a wood-free ethanol redwood extract containing water insoluble phlobaphenes, water soluble tannins and related phlobaphenes. No. 2,334,564. Harry Lewis to The Pacific Lumber Co.

Recovering values from waste calcium sulfite liquor comprising spray-drying said liquor in a stream of hot gases to form a finely divided mixed inorganic and organic powder. No. 2,334,621. Edward G. Goodell.

Separating from each other bodies that are amenable to hydraulic separation. No. 2,334,685. Frank Smith to E. I. du Pont de Nemours & Co.

Industrial Chemicals—Organic

Separating a substantially pure aromatic fraction consisting essentially of aromatics of identical molecular weight from a hydrocarbon mixture containing non-aromatic hydrocarbons and having a relatively wide boiling range above and below the boiling temperatures of said aromatics. Reissue No. 22,379. Original No. 2,288,126. Clarence Dunn and Robert McConaughy to Shell Development Co.

Preparing a benzothiazolium alkyl quaternary salt comprising hydrolyzing, in the presence of an acid, a 3-alkyl-2-dicarbalkoxymethylene-benzothiazoline. No. 2,330,203. Leslie Brooker and William Williams to Eastman Kodak Co.

N-glucoside-like condensation products of a sugar of 5 to 6 carbon atoms with an amino compound of the benzene series. No. 2,330,222. Richard Kuhn and Rudolph Strobele to Winthrop Chemical Co., Inc.

Producing a 2-aminothiazole which comprises reacting thiourea with a haloacetal. No. 2,330,223. Lucas Kyrides to Monsanto Chemical Co.

Accelerating the hardening of an alkylated resol which comprises adding to the resol a performed acidic partial phosphoric ester. No. 2,330,286. Herbert Honel to Reichold Chemicals, Inc.

Homogeneous mixture of a polymeric material in which the predominant constituent is a vinyl halide, and a copolymer of a butadiene-1,3 hydrocarbon and an acrylic nitrile. No. 2,330,353. Donald Henderson to The B. F. Goodrich Co.

Preparation of biguanide, guanylurea, and their substitution products. No. 2,330,376. Robert Parker to American Cyanamid Co.

Preparing esters of pyrimidine compounds having a carboxyl group in the 5 position. No. 2,330,380. Donald Price, Everette May, and Frank Pickel to National Oil Products Co.

Making mercuric naphthenate. No. 2,330,452. Harold Schiller to Socony-Vacuum Oil Co., Inc.

Certain water-soluble high molal oxyalkylated esters and method of making same. No. 2,330,472. Melvin De Groote and Bernhard Keiser to Petrolite Corp., Ltd.

Certain water-soluble high molal oxyalkylated esters and method of making same. No. 2,330,473. Melvin De Groote and Bernhard Keiser to Petrolite Corp., Ltd.

Dispersion of polyisobutylene in aqueous mediums. No. 2,330,504. Gerry Mack.

Production of a styrene-type polymerization product by subjecting an admixture of styrene with polymers thereof to polymerizing conditions, in the presence of an ester of crotonic acid. No. 2,330,527. Hanns Staudinger to The Distillers Co., Ltd.

Preparing a halo acetal. No. 2,330,570. Edward Filachione to Monsanto Chemical Co.

Hydrating pinene-containing materials. No. 2,330,579. Torsten Hasselstrom to G and A Laboratories, Inc.

Flotation reagent comprising an organic dithiophosphoric acid compound and from 6 to 10% of di-tolyl thiourea. No. 2,330,587. David Jayne, Jr. to American Cyanamid Co.

Compounds having the general formula:

$$\begin{array}{c} \quad\;\; H\; R_3 \\ Aq\text{-}NHCO\text{-}C\text{-}CH\text{-}SO_3\text{-}H \\ \quad R_2 \end{array}$$

wherein Aq is an anthraquinone radical which is attached to the amido group through a carbocyclic atom, one of the R's is hydrogen and the other alkyl. No. 2,330,713. George Holbrook and Louis Spiegler to E. I. du Pont de Nemours & Co.

Preparation of thioaniline. No. 2,330,714. Lee Holt to E. I. du Pont de Nemours & Co.

Geochemical prospecting for subsurface carboniferous deposits. No. 2,330,716. Leo Horvitz to Esme Rosaire.

Recovering a sample of gas containing hydrocarbons for analysis from a soil sample. No. 2,330,717. Leo Horvitz to Esme Rosaire.

Cracking and distillation of oils. No. 2,330,760. Alfred Thomsen.

Making crystallized dextrose. No. 2,330,785. James Walsh to American Maize-Products Co.

Making a 2-alkyl alpha-naphthoselenazole. No. 2,330,791. Edmund Middleton and George Dawson to E. I. du Pont de Nemours & Co.

Vulcanized, fatty oil modified, cracked distillate polymer. No. 2,330,798. Martin Chittick and Arthur F. Schlandt to The Pure Oil Co.

Treating cocobola wood having its natural phenolic-reacting constituents which when treated with an aldehyde form an insoluble condensation product. No. 2,330,826. James Hunn to The Sherwin-Williams Co.

Converting hydrocarbons to carbon disulfide. No. 2,330,934. Carlisle Thacker to The Pure Oil Co.

Cyclopropyl ether containing not over 6 carbon atoms and having the general formula R-O-R′, where R is the cyclopropyl radical and R′ is an aliphatic hydrocarbon radical. No. 2,330,979. John Krantz, Jr., and Nathan Drake.

Producing a bituminous emulsion of the quick breaking type which comprises melting asphalt, commingling said melted asphalt with water a saponifiable acid and a caustic alkali. No. 2,331,022. Ross Garofalo and Frederick Scott to Union Oil Co. of California.

Denatured alcohol containing as an essential denaturant, a denaturing quantity of a mixture of aldehydes prepared by oxidizing a mixture of higher alcohols obtained in the high pressure synthesis of methanol from hydrogen and oxides of carbon. No. 2,331,032. Hamline Kvalnes to E. I. du Pont de Nemours & Co.

Cellulose ether composition comprising an organo-soluble cellulose derivative plasticized with a beta-aryloxy, beta'chloro dialkyl ether having the general formula. No. 2,331,090. Arnold Gabel and Fred Taylor to The Dow Chemical Co.

Preparation of methyl hydroxyacetate which comprises dehydrating hydroxyacetic acid until it analyzes between 104% and 110% hydroxyacetic acid. No. 2,331,094. Donald Loder to E. I. du Pont de Nemours & Co.

Making a white, pulverulent, granular co-polymer of styrene, characterized by being substantially insoluble and non-swelling in benzene, in a form readily separable from the benzene swellable co-polymer normally formed simultaneously therewith. No. 2,331,263. Edgar Britton, Gerald Coleman and John Zemba to The Dow Chemical Co.

Ethers of bis-phenols. No. 2,331,265. Gerald Coleman and Bartholdt Hadler, and Robert Sapp to The Dow Chemical Co.

Organic thiocyanates and isothiocyanates and process of preparing the same. No. 2,331,276. Josef Pikl to E. I. du Pont de Nemours & Co.

Producing a monoalkylphthalyl ester of 2-hydroxycyclohexanone. No. 2,331,329. Lucas Kyrides to Monsanto Chemical Co.

Production of a formal by condensation of an aldehyde with an aliphatic hydroxy compound selected from the group consisting of polyhydric alcohols, partial ethers of polyhydric alcohol and aliphatic hydroxy carboxylic acids. No. 2,331,367. John Baggett to Celanese Corp. of America.

Preparing a mono-(biguanido) benzene monosulphonamide. No. 2,331,375. Gaetano D'Alelio to General Electric Co.

Reaction product of an aldehyde and a biguanido carbocyclic sulfonamide. No. 2,331,376. Gaetano D'Alelio to General Electric Co.

A heat-curable aminoplast. No. 2,331,377. Gaetano D'Alelio to General Electric Co.

Water-soluble compounds as new products derivatives of arylamides of aromatic o-hydroxycarboxylic acids capable of coupling. No. 2,331,415. Heinrich Morschel and Wilhelm Meiser to General Aniline & Film Corp.

An adhesive comprising a water-soluble heat-hardable condensation product obtained by condensing aldehyde and triazine. No. 2,331,446. Gustave Widmer and Willi Fisch to Ciba Products Corp.

Fuel saving method of extracting sulfur vapor and liquid from native sulfur ore and condensing the vapor. No. 2,331,524. William Rogers Wade.

Recovering bilirubin from natural complexes containing the same. No. 2,331,574. Robert Sifferd and Fred Solms to Armour & Co.

Producing dehydroabietane which comprises reducing dehydroabietinal semi-carbazone by contacting with sodium ethylate and ethyl alcohol at a temperature within the range of about 150° C. to about 230° C. No. 2,331,596. William Campbell to Hercules Powder Co.

Methylol Beta, Beta-Prime-Iminodipropionic Acid. No. 2,331,677. Roy Hanslick to American Cyanamid Co.

Making chloroacetonitrile which comprises treating glycolonitrile in the presence of an organic base with an **acid chloride.** No. 2,331,681. Ingenuin Hechenbleikner to **American Cyanamid Co.**

Producing chloroacetonitrile which includes the steps of reacting glycinonitrile hydrochloride with nitrosyl chloride and recovering the chloroacetonitrile from the reaction product. No. 2,331,682. Ingenuin Hechenbleikner to American Cyanamid Co.

Preparing alpha-naphthylacetamide which includes the steps of heating a solution consisting of alpha-naphthylacetonitrile dissolved in sulfuric acid, adding the solution to water whereby alpha-naphthylacetamide is precipitated, separating and recovering the alpha-naphthylacetamide. No. 2,331,711. Vartkes Migrdichian to American Cyanamid Co.

Preparation of naphthoquinone which comprises adding a solution of 2-methylnaphthalene in glacial acetic acid to a solution of chromic acid. No. 2,331,725. Robert Price and Gustaf Carlson to Lederle Laboratories, Inc.

Cyclohexylamine salt of 2-mercapto-4-phenyl-thio diazole 5-thione. No. 2,331,749. George Watt to Wingfoot Corp.

Producing rosin esters of a rosin and an aliphatic **glycol** having no more than 3 carbon atoms. No. 2,331,803. Raymond Schlaanstine, to Hercules Powder Co.

Sodium bisulfite adduct of beta- methyl-alpha-naphthoquinone. No. 2,331,808. Robert Shelton and Marcus Van Campen, Jr., to The Wm. S. Merrell Co.

Organic arsenic compounds. No. 2,331,833. Cliff Hamilton to Parke, Davis & Co.

Producing tocopherol-like compounds which comprises coupling an ortho allylic phenol having vacant the position para to the hydroxyl group with an aromatic diazonium compound. No. 2,331,849. Lee Smith to Regents of the University of Minnesota.

Preparing solutions of cellulose glycollic acid salts, a water-insoluble polyvalent metal salt of a cellulose glycollic acid whose sodium salt is water-soluble. No. 2,331,858. Richard Freeman and Martin Roberts to The Dow Chemical Co.

Preparing a stable aqueous solution of aluminum cellulose glycollate having a high viscosity. No. 2,331,859. Martin Roberts to The Dow Chemical Co.

Preparing powdered cellulose ethers quickly soluble in cold water. No. 2,331,864. Richard Swinehart and Albert Maasberg to The Dow Chemical Co.

Preparing a cold-water-soluble cellulose ether which is readily wettable by and soluble in water. No. 2,331,865. Richard Swinehart and Albert Maasberg to The Dow Chemical Co.

Making diethers of 2,3-dihydroxydioxanes by simultaneously condensing glyoxal with a monohydric alcohol and a 1,2-alkylene glycol, and removing water from the zone of reaction. No. 2,331,993. Louis MacDowell and Henry C. Chitwood to Carbide & Carbon Chemicals Corp.

Manufacture of high polymers of allyl type halides. No. 2,331,869. David Adelson and Hans Dennenberg to Shell Development Co.

Recovery of a distillable fatty acid from a salt by subjecting the sale to reaction with a normally solid inorganic acid selected from the group consisting of boric acid, hydrated alumina and silicic acid. No. 2,331,965. Henry Dreyfus to Celanese Corp. of America.

Aldehyde-aminothiazoline reaction product containing at least one amino hydrogen atom in which amino nitrogen is connected directly to thiazoline ring at the 2-position with an aldehyde. No. 2,331,995. Roger Mathes to The B. F. Goodrich Co.

Dewaxing mineral oils, including mixing the waxy oil with dewaxing solvent comprising picoline, and amyl mercaptan as selective type solubility enhancing agent. No. 2,331,998. James Montgomery, Luke Goodson and Robert Henry to Phillips Petroleum Co.

Dewaxing mineral oils including mixing the waxy oil with a dewaxing solvent comprising picoline, and diamyl sulfide as a selective type solubility enhancing agent. No. 2,331,999. James Montgomery, Luke Goodson and Robert Henry to Phillips Petroleum Co.

Agglomerating flocculent dry carbon black into carbon black granules. No. 2,332,057. Samuel Carney to Phillips Petroleum Co.

Salt of epinephrine with a carboxylic acid compound of the class consisting of non-halogenated alkyl partial esters of polybasic acids and non-halogenated aryl-alkyl partial esters of polybasic acids. No. 2,332,075. Edwin Gustus to Wilson & Co., Inc.

Adhesive sheet comprising a cellulosic backing material, a normally dry, water insoluble adhesive coating united thereto. No. 2,332,137. Richard Drew, to Minnesota Mining & Mfg. Co.

Preparation of a terpene polysulfide. No. 2,332,165. Emil Ott, to Hercules Powder.

Producing phenazine oxide which comprises subjecting nitrobenzene and aniline to condensation with an alkaline condensing agent in the presence of an inert diluting solvent and with a ratio of nitrobenzene to aniline equal to the molecular ratio. No. 2,332,179. Edward Soule to The Mathieson Alkali Works, Inc.

Pressure-sensitive adhesive sheet, comprising a backing consisting of a plasticized polymer in which the principal constituent is vinyl chloride, and an adhesive layer consisting of rubber, polyisobutylene, and a member of the class consisting of melted rubber, rosin, and ester gum. No. 2,332,265. Richard Schmidt to The B. F. Goodrich Co.

Producing tri-isobutylene. No. 2,332,298. Louis Clarke and George Hatch Ernest Pevere to The Texas Company.

Condensation Product of an aminotriazole, and aldehyde and a halogenated amide, selected from the class consisting of alpha halogenated amides, beta halogenated amides and alpha beta halogenated amides, which contain at least one—CONH2 grouping. No. 2,332,302. Gaetano D'Alelio to General Electric Co.

Condensation product of ingredients comprising an aminotriazole, and aldehyde and an aldehyde-reactable halogenated acylated **urea.** No. 2,332,303. Gaetano D'Alelio to General Electric Co.

Gaseous Metal Deposition for plating continuous metal strips. No. 2,332,309. Folsom Drummond The Commonwealth Engr. Co.

Method of analyzing gaseous mixtures. No. 2,332,337. Francis Norton to General Electric Co.

Recovery of ortho-xylene from sulfuric acid-washed oil, containing same and containing like-boiling olefins and other like-boiling non-aromatic hydrocarbons formed by high temperature decomposition of petroleum oil. No. 2,332,370. Percy Cole to Allied Chemical & Dye Corporation.

Thiocarbonates of aromatic polyhydroxy compounds. No. 2,332,418. Georg Werner to Winthrop Chemical Co.

Forming a polymer by esterifying polymerized monounsaturated monohydric, lower aliphatic alcohol with monomeric monounsaturated lower aliphatic monocarboxylic acid while minimizing polymerization of ester and polymerizing ester. No. 2,332,460. Irving Muskat and Maxwell Pollack to Pittsburgh Plate Glass Co.

Producing an ether which comprises reacting an alcohol and an alkyl halide in the presence of metallic zinc at a temperature of from about 75° to about 115° C. No. 2,332,467. Carl Linn and Vladimir Ipatieff to Universal Oil Products Company.

Unsaturated nitro-alcohol. No. 2,332,482. Edward Degering and Austin Sprang to Purdue Research Foundation.

Producing acyl compounds of polycyclic alcohols with germinal gland hormone characteristics. No. 2,332,486. Friedrich Hildebrandt, Hohen Neuendorf Schering Corporation.

Catalytic process for nitration of hydrocarbons. No. 2,332,491. Murray Senkus to Commercial Solvents Corp.

Separation of hydrocarbons conducting a distillation separation of an aromatic hydrocarbon material from non-aromatic hydrocarbons of substantially similar boiling point. No. 2,332,493. Theodor Petry Henry Noll and Russell Lee to Socony-Vacuum Oil Co.

Urea-formaldehyde type resin product comprising a reaction product prepared by heating to a condensing temperature dormaldehyde and a solution of casein with a urea. No. 2,332,519. Carl Leonardson and Donald White to The Borden Co.

Preparation of a tertiary alkyl phenol having at least 6 carbon atoms in the alkyl group from a tertiary olefin and a phenol in the liquid phase. No. 2,332,555. Hyym Buc to Standard Oil Development Co.

Catalytic nondestructive hydrogenation of unsaturated organic material in the liquid phase. No. 2,332,572. Harold Hepp and Jean Jones to Phillips Petroleum Co.

Production of 2-aminopyrimidine which comprises the reduction of 2-amino-4-chloropyrimidine in an acid solution and adding zinc chloride forming a double salt consisting of one mole of zinc chloride and one mole of 2-aminopyrimidine. No. 2,332,615. Edmond Tisza Bernard Duesel Harris Friedman to Nepera Chemical Co.

Acetylated sugar compound 1-N-tetraacetyl-d-ribityl-amino-2-phenylazo-4,5-dimethylbezene. No. 2,332,666. Richard Pasternack Ellis Brown Charles Pfizer & Co.

Preparation of chlor-isoolefins comprising subjecting 2-methyl-2,3-dichlorbutane to thermal dehydrochlorination. No. 2,332,778. Hyym Buc and Clifford Muessig, to Standard Oil Development Co.

Manufacture of water gas by a cyclic process in which an ignited fuel bed in a generation is alternately blasted with air to raise its temperature and then steamed to produce water gas. No. 2,332,781. Hugh Thruston Cohen Humphreys & Glasgow Limited.

Refining of mineral oils separated from acid sluges secured in the treatment of a feed oil with a mineral acid. No. 2,332,793. Eugene Hermann to Standard Oil Development Co.

Preparation of higher unsaturated aliphatic alcohols, in the catalytic reduction of higher molecular unsaturated aliphatic acids to the corresponding alcohols at elevated temperatures and pressures in the presence of hydrogen. No. 2,332,834. Gustav Schuckmann, to American Hyalsol Corp.

New cycloalkenyl-monophenol, 2-methyl-1-(4'-hydroxyary) cycloalkene-1. No. 2,332,867. Joseph Niederl.

Separating carbonic acid from gas mixtures containing carbonic acid. No. 2,332,887. Heinrich Biederbeck and Georg Fischer.

Synthetic composition comprising hydrolyzed acetalized, and-or ketalized copolymers of vinyl esters and unsaturated organic ethers. No. 2,332,895. Gaetano D'Alelio to General Electric Co.

Synthetic composition, obtained by simultaneously hydrolyzing and acetalizing an infusible, insoluble copolymer of vinyl acetate and diallyl phthalate. No. 2,332,896. Gaetano D'Alelio to General Electric.

Synthetic composition, comprising hydrolyzed, acetalized, and/or ketalized copolymers of vinyl ester and unsaturated detones containing at least one CH2-C grouping. No. 2,332,897. Gaetano D'Alelio to General Electric.

Synthetic composition, comprising hydrolyzed, acetalized, and/or ketalized copolymers of vinyl esters and unsaturated alkyd **resins.** No. 2,332,898. Gaetano D'Alelio to General Electric.

Synthetic composition, comprising hydrolyzed, acetalized, and/or ketalized copolymers of vinyl esters and organic nitriles containing at least one CH2-C grouping. No. 2,332,899. Gaetano D'Alelio to General Electric Co.

Synthetic composition, comprising hydrolyzed, acetalized, and/or ketalized polymers of allyl esters. No. 2,332,900. Gaetano D'Alelio to General Electric Co.

Synthetic Composition, comprising hydrolyzed, acetalized, and/or ketalized copolymers of vinyl esters and unsaturated ketones. No. 2,332,901. Gaetano D'Alelio to General Electric Co.

Preparation of sulfonamide derivatives. No. 2,332,906. Zoltan Foldi, Arpad Gerecs, Istvan Demjen, and Rezso Konig.

Water-in-oil emulsion, the oil phase comprising a high-boiling hydrocarbon oil having therein a water-insoluble resin and the water phase contain- in an alkali-metal halide. No. 2,332,939. Hilger Schmitz and Hermann Unterguggenberger.

Making aldol from acetaldehyde in an alkaline medium. No. 2,332,949. Ladislas Szlatinay.

Flexible abrasive article, comprising a composite backing consisting of a cellulosic sheet, a fabric sheet adhesively attached to one face of said cellulosic sheet, and a heat-hardening resin a layer of abrasive particles adhesively attached. No. 2,333,035. Nicholas Oglesby to Behr Manning Corp.

Separating hematoxylin from logwood extract. No. 2,333,050. Roy Shunkwiler to Hartmen-Leddon Co.

An aqueous emulsion the disperse phase of which contains tetraethylthiuram monosulfide in admixture with minor amount of tetraethylthiuram disulfide sufficient to reduce the pourpoint of the tetraethylthiuram monosulfide. No. 2,333,084. Albert Flenner and Bernard Sturgis to E. I. du Pont de Nemours & Co.

Cosmetic preparation comprising the product resulting from esterifying sulfurized olive oil with mono-hydric alcohol. No. 2,333,095. Frederick E. Dearborn.

Embalming composition containing about 3-17 per cent glyoxal. No. 2,333,182. Hilton Jones to Hizone Products.

Manufacture of ketones of the cyclopentanopolyhydrophenanthrene series. No. 2,333,202. Leopold Ruzicka and Albert Wettstein to Ciba Pharmaceutical Products, Inc.

Production of aldehydes which consists in treating alcohols of the acetylene series. No. 2,333,216. Hans-Georg Trieschmann, Erich Jutz, and Franz Reicheneder.

Recovery of normally condensable hydrocarbons from gas-oil mixtures flowing from high pressure wells having a high gas:oil ratio. No. 2,333,229. Paul Barton to Sun Oil Co.

Administration capsule inert to colloidal preparations of iodine and other halogens composed of substantially non-reactive film-forming components consisting essentially of a cellulose ether and a xenyl phosphate selected from the group consisting of di-phenyl mono-ortho-xenyl phosphate and di-(ortho-xenyl) mono-phenyl phosphate. No. 2,333,283. Wilbert Moody Wilson.

Recovery of phthalic anhydride values from phthalic anhydride distillation residue containing phthalic anhydride and higher boiling water-soluble constituents. No. 2,333,368. Edwin Gaskill, Jr., to Allied Chemical & Dye Corp.

Arylaminoanthraquinone compound. No. 2,333,384. David Klein to E. I. du Pont de Nemours & Co.

Dicyandiamide-formaldehyde reaction product. No. 2,333,390. Kurt Ripper to American Cyanamid Co.

Hydroxyaminobenzenesulphonamides. No. 2,333,445. Richard Roblin, Jr., and George Anderson to American Cyanamid Co.

Carbamylguanamines. No. 2,333,452. Jack Thurston, Cos Cob, and Daniel Nagy to American Cyanamid Co.

Estrogenic agents. No. 2,333,486. Edmond Moore to Abbott Laboratories.

Azocyclic Compound, 2-hydroxy-4-aminopyridine having hydrocarbon substituents on carbons 5 and 6. No. 2,333,493. George Rigby to E. I. du Pont de Nemours & Co.

Forming a solution of a derivative of glycinin which comprises dispersing glycinin in an alkaline solution in the presence of a water-soluble salt of an hydroxyalkyl sulfoxylic acid. No. 2,333,526. Russell Denyes to Tubize Chatillon Corporation.

Artificial filament resulting from the precipitation in an acid bath of a homogeneous mixture of viscose, and an alkaline solution of glycinin and a hydroxy-alkyl sulfoxylate. No. 2,333,527. Russell Denwes and Bruce Allen to Tubize Chatillon Corporation.

Producing tetra hydroxyphenyl alkanes, 2. A poly hydroxyaryl hexane, 2,2,5,5-(4'hydroxyaryl)-hexane, wherein hydroxyaryl radicals are selected from class consisting of hydroxnaphthyl, hydroxphenyl and ortho alkylated hydroxyphenyl radicals. No. 2,333,568. Joseph B. Niederl.

Denyes and Bruce Allen to Tubize Chatillon Corporation.

Manufacturing diphenyl-sulfone derivatives. No. 2,333,552. Paul Pohls and Fritz Mietzsch and Alfred Rohm to Winthrop Chemical Co. Inc.

Extraction of hydrocarbon sulphonyl chlorides. No. 2,333,568. Clyde Henke and Frank Schofield to E. I. du Pont de Nemours & Co.

Reaction of epinephrine with sterols. No. 2,333,581. Richard Roberts to Armour & Co.

Polmerizing an unsaturated organic compound. No. 2,333,633. Edgar Britton and Walter LeFevre to The Dow Chemical Co.

Copolymerization of vinyl halides with vinylidene halides which comprises forming an aqueous emulsion of a vinyl halide and a vinylidene halide, which emulsion contains small proportions of a water-soluble acid, a per-oxygen compound, and a ferric compound, and co-polymerizing the vinyl halide and vinylidene halide while in the emulsion. No. 2,333,634. Edgar Britton and Clyde Davis to The Dow Chemical Co.

Polymerizing vinyl compounds which comprises dissolving a polymerizable compound, together with minor proportions of a water-soluble acid, a per-oxygen compound, and a ferric compound in an inert solvent and polymerizing the vinyl compound while in the solution. No. 2,333,635. Edgar Britton and Walter LeFebre to The Dow Chemical Co.

Treatment of polyesters and product therefrom. No. 2,333,639. Robert Christ and William Hanford to E. I. du Pont de Nemours & Co.

Luminous adhesive sheet or tape comprising a transparent or translucent flexible sheet backing having exposed non-drying pressure-sensitive adhesive coating on one face, said adhesive coating including a white reflective pigment and a luminous material visible through backing. No. 2,333,641. Carlton Corwin to Minnesota Mining & Manufacturing Co.

Treating a hydrocarbon mixture containing as an impurity a relatively small percentage of organically combined fluorine to remove fluorine therefrom which comprises contacting said mixture with a fluoride of a metal of group II of periodic table under dehydrofluorinating conditions of temperature and pressure, and recovering treated hydrocarbons. No. 2,333,649. Aristid Grosse and Carl Linn to Universal Oil Products Co.

Antioxidant for fats and oils comprising an oleaginous material in which material is included both a small amount of an ascorbic acid and a small amount of tocopherol type compound. No. 2,333,655. Henry Mattill and Calvin Golumbic to Lever Brothers Co.

Antioxidant for fats and oils producing a synergistic action of inhibiting oxidation and the development of rancidity in the oleaginous matter. No. 2,333,656. Henry Mattill and Calvin Golumbic to Lever Brothers Co.

Antioxidant for fats and oils comprising an oleaginous material in which is included a small amount of caffeic acid. No. 2,333,657. Henry Mattill and Calvin Golumbic to Lever Brothers Co.

Antioxidant for fats and oils comprising an oleaginous material in which is included a hexuronic acid and a cyclic oxy compound selected from the group consisting of quinones, hydroquinones, naphthoquinones, naphthols, naphthohydroquinones, chromans, chromens, coumarones and coumarans. No. 2,333,658. Henry Mattill and Calvin Golumbic to Lever Brothers Co.

Adhesive composition suitable for application as an adhesive at a temperature of from 350° F. to 450° F. to secure the joints of a container constructed of fibrous material, consisting of a mixture of vinyl acetate and pentaerythrityl-abietate resin. No. 2,333,676. John Robinson to American Can Co.

Manufacture of pentaerythritol, the step which comprises reacting formaldehyde with acetaldehyde in the presence of a basic substance adapted to promote the reaction. No. 2,333,696. Joseph Bludworth to Celanese Corp. of America.

Acid process which comprises adding material from the group consisting of acetic acid and acetic anhydride to oleum. No. 2,333,701. Frank Cockerille to E. I. du Pont de Nemours & Co.

Preparing camphoric acid which comprises oxidizing with nitric acid a compound of the group consisting of camphor, borneol, isoborneol and bornyl chloride and mixtures of said compounds in presence of a substance of the group consisting of mercury and mercury salts. No. 2,333,718. Paul Heisel.

Preparing ether acids, producing mixtures of compounds containing the anions of monobasic aliphatic ether acids and of monobasic aliphatic carboxylic acids. No. 2,333,726. Heinz von Leibitz-Piwnicki and Friedrich Meidert.

High-molecular compounds of the polyamide type which comprises subjecting to a continued heat treatment a substance selected from the class consisting of acrylic acid and the amide forming derivatives thereof together with a primary monoarylamine. No. 2,333,752. Hanns Ufer.

Recovery of lower aliphatic acids from aqueous solutions. No. 2,333,756. Theodore Wentworth to The Vulcan Copper & Supply Co.

4(1)-Halo-1(4)-acyloxyvaleric acid and derivatives preparing a 4-halo-1-hydroxyvaleric acid comprising reacting an acyl halide with a tetrahydrofluoric acid alkyl ester in presence of a metallic halide, and hydrolyzing with a mineral acid. No. 2,333,771. Joseph Dickey and Robert Corbitt to Eastman Kodak Co.

Alpha, Beta'-Dicyano Diethyl Ether. No. 2,333,782. Virgil Hansley to E. I. du Pont de Nemours & Co.

Making hydrocarbon sulphonyl chlorides which comprises reacting in the liquid phase an alkane of 1 to 5 carbon atoms with admixed liquid chlorine and liquid sulfur dioxide while irradiating the same with actinic light. No. 2,333,788. George Holbrook, Arthur Fox, and Arthur Baum and Willis Clem to E. I. du Pont de Nemours & Co.

Improving the storage properties of alkyl aryl sulphonates in which the aryl nucleus is free from groups oxidizable by hypochlorites and the alkyl groups are derived from a petroleum distillate. No. 2,333,830. Gilbert Toone to Allied Chemical & Dye Corp.

Catalytic conversion of hydrocarbon oils. No. 2,333,851. Gustav Egloff to Universal Oil Products Co.

Conversion of hydrocarbons which comprises fractionating a hydrocarbon oil in commingled state with vaporous conversion products produced in the process. No. 2,333,852. Gustav Egloff to Universal Oil Products Co.

Producing alkylated aromatic hydrocarbons. No. 2,333,866. Vasili Komarewsky to Universal Oil Products Co.

Producing a 5-membered ring cyclo-olefins. No. 2,333,903. Charles Thomas and Herman Bloch to Universal Oil Products Co.

Isocyanate treatment of polyamides. No. 2,333,914. Gerard Berchet to E. I. du Pont de Nemours & Co.

Tertiary amyl alcohol-formaldehyde condensation product. No. 2,333,927. Mortimer Harvey to Harvel Research Corporation.

Tertiary butyl alcohol-formaldehyde condensation product. No. 2,333,928. Mortimer Harvey to Harvel Research Corporation.

Tertiary hexyl alcohol-formaldehyde condensation product. No. 2,333,929. Mortimer Harvey to Harvel Research Corporation.

Production of alkyl halides. No. 2,334,033. Earl Riblett to Process Management Co. Inc.

Making thiamine iodide hydroiodide which comprises treating thiamine chloride hydrochloride with sodium in the presence of glacial acetic acid. No. 2,334,067. Leopold Cerecedo and Jacob Tolpin.

Production of acrolein. No. 2,334,091. Karl Herstein to Acrolein Corp.

Production of polyalkyl derivatives of cyclohexane which comprises reacting an alky cyclohexane with a mono-olefin in the presence of sulfuric acid and under alkylating conditions. No. 2,334,099. Vladimir Ipatieff and Herman Pines to Universal Oil Products Co.

Hydrogenating an alkyl aryl ketone. No. 2,334,100. Vladimir Ipatieff and Vladimir Haensel to Universal Oil Products Co.

Preparing 2-alkyl-naphthoquinones. No. 2,334,103. Charles Koelsch to Regents of the University of Minnesota.

Alkylating an isoparaffin by reaction with an alkylating agent which comprises contacting said isoparaffin and alkylating agent with an inorganic acid alkylation catalyst containing a salt of a metal of the first transition series in group VIII of the periodic table. No. 2,334,108. Sumner McAllister, John Anderson, and Edwin Bullard to Shell Development Co.

Reducing acrylonitrile to propionitrile which comprises hydrogenating a solution of acrylonitrile at a pressure of at least 6 atmospheres and at a temperature between 20° C. and 75° C. in the presence of Raney nickel as a catalyst. No. 2,334,140. Charles Winans to Wingfoot Corp.

Preparing a guanyl base included in the group consisting of guanidines and biguanides. No. 2,334,151. Jack Thurston to American Cyanamid Co.

Producing 2-amino-1,3,5-triazine which comprises heating a mixture of formyl guanidine, formamide, and sodium hydroxide until a clear melt is obtained and subsequently subjecting to distillation. No. 2,334,162. Jackson English and Joseph Paden to American Cyanamid Co.

Producing beta-aminopropionic acid which comprises reacting bis-(cyanoethyl* amine with aqueous ammonia. No. 2,334,163. Philip Kirk to American Cyanamid Co.

Alpha-pyrone and method of preparing it. No. 2,334,180. Robert Elderfield and Josef Fried to Eli Lilly & Co.

Organic sulphonamides prepared by reacting a nitrogen base taken from the class consisting of ammonia and amines with a saturated hydrocarbon sulphonyl chloride. No. 2,334,186. Arthur Fox to E. I. du Pont de Nemours & Co.

Preparing 1-cyano-1,3-butadiene which comprises passing tetrahydrofuramide over a dehydration-type catalyst. No. 2,334,192. William Hanford to E. I. du Pont de Nemours & Co.

Production of from semi-solid to solid polymerization products which consists in subjecting ethylene in admixture with a further unsaturated compound, capable of copolymerizing with ethylene. No. 2,334,195. Heinrich Hopf and Siebert Goebel to General Aniline & Film Corp.

Naphthalene derivatives. No. 2,334,200. Wilbur Kamm and Benjamin Tullar to Parke, Davis & Co.

Naphthalene derivatives. No. 2,334,201. Wilbur Kamm and Benjamin Tullar to Parke, Davis & Co.

Producing saturated hydrocarbon radical fluorophenols. No. 2,334,229. Chester Suter to Sharp & Dohme, Inc.

Geochemical prospecting for subsurface petroliferous deposits in which soil gas is recovered from soil, the step of preliminarily treating the soil with a water soluble organic wetting agent. No. 2,334,269. Stephen Kiss to Standard Oil Development Co.

Preparing a heat- and storage-stable chlorinated polyisobutylene, comprising the steps of dissolving polyisobutylene and natural rubber in a chlorine-resistant solvent, and chlorinating the polymer and rubber. No. 2,334,277. Charles Morrell, Per Frolich and Lewis Bannon to Jasco, Inc.

Nuclear saturated and unsaturated compounds of the ring-D-homo-steroids. No. 2,334,291. Leopold Ruzicka and Moses Goldberg to Ciba Pharmaceutical Products, Inc.

Antispasmodic agents, comprising the aminoalcohol esters of xanthene-9-carboxylic acid. No. 2,334,310. Robert Burtner to G. D. Searle & Co.

Ester and method of making same, a water-soluble ester. No. 2,334,-389. Melvin DeGroote to Petrolite Corp. Ltd.

Water-insoluble oxyalkylated drastically oxidized castor oil. No. 2,334,390. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Drastically oxidized water-insoluble oxyalkylated triricinolein, member of the class consisting of triricinolein and castor oil. No. 2,334,-391. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Producing 2,2'-dihydroxy-5,5'-dichloro diphenyl methane which comprises gradually adding a formaldehyde-yielding substance to a mixture of parachloro phenol, sulfuric acid and insert solvent while maintaining the temperature between —10° C. and 0° C. No. 2,334,408. William Gump and Max Luthy to Burton Bush, Inc.

Unsaturated isocyanate isopropenyl isocyanate. No. 2,334,476. Donald Coffman to E. I. du Pont de Nemours & Co.

Derivatives of dihydro-pyridone. No. 2,334,490. Max Hoffer to Hoffmann-LaRoche Inc.

Neutralization of aromatic sulfonic acids which comprises mixing an aromatic sulfonic acid with an alkali metal sulfite in the presence of water equivalent to between 10% and 50% of weight of the sulfonic acid, and recovering the alkali aromatic sulfonate produced. No. 2,334,500. Stuart Miller to Allied Chemical & Dye Corp.

Purifying hydroxy aliphatic acids of lactic and glycolic acids. No. 2,334,524. Henry Wenker to Apex Chemical Co. Inc.

Condensation product of a urea, an aliphatic aldehyde, and a mono salt of a polyamine. No. 2,334,545. Gaetano D'Alelio to General Electric Co.

Isomerizing liquefied normal butane with a catalyst comprising aluminum chloride at temperatures in the range from about 150° F. to 300° F. while said normal butane is maintained under sufficient pressure to remain in the liquid phase. No. 2,334,553. Clarke Harding to Standard Oil Development Co.

Mono-acyl derivatives of 2-methyl 1,4-naphtho-hydroquinone. No. 2,334,669. Gustaf Carlson and Bernard Baker to Lederle Laboratories, Inc.

Medicinals

Therapeutic agent comprising a sulfonated sulphamido-benzene-azo-pyrazolone, the benzene being unsubstituted in the 2, 3, 5 and 6 positions. No. 2,330,828. Irwin Lubowe and Willard Somerville.

Spermicide comprising ricinoleic acid derived from castor oil and suspended in a vehicle in finely dispersed particle resembling oily droplets. No. 2,330,846. Frank Sander to Ortho Products, Inc.

Producing organic compound of antimony, which consists in adding antimonial catechol to triisopropanolamine and heating the mixture until the reaction is completed. No. 2,330,963. Joseph Feinberg to Parke, Davis & Co.

Producing organic compound of arsenic, which consists in adding arsenic trioxide to triisopropanolamine and heating the mixture until the reaaction is completed. No. 2,330,963. Joseph Feinberg to Parke, Davis & Co.

Antihemorrhagic compound process of converting a substance into 2-methyl-3-phytyl-1,4-naphthoquinone, consisting of heating the said substance, whereby conversion is effected. No. 2,331,008. Max Tishler and Norman Wendler to Merck & Co., Inc.

Manufacture of p.p'-disubstituted diphenylsulphones comprising heating a salt of a p-acylamino-benzene-sulphuric acid with a 1-halogen-4-nitrobenzene to produce a p-acylamino-p'-nitro-diphenyl sulphone, and reducing the product to the corresponding p'-amino compound. No. 2,331,009. Rudolf Tschesche and Kurt Bohle to Schering Corp.

Thyreotropic hormone preparation obtained by precipitation of the thyreotropic hormone and accompanying albuminous substances from an extract of the anterior lobe of the hypophyses. No. 2,331,-334. Hans Maier-Huser and Karl Junkmann to Schering Corporation.

Fat-soluble vitamin antioxidant comprising acetyl methyl carbinol as the active constituent. No. 2,331,432. Eric Simons and Loran Buxton to National Oil Products Co.

Producing therapeutically valuable alcohols from germinal gland hormones. No. 2,330,215. Friedrich Hildebrandt to Schering Corp.

Antigenic composition suitable for injection into living beings. No. 2,332,521. Peter Masucci to Sharp & Dolme Incorp.

Compounds of the harmone series, delta 4, delta 6, androstadiene-dione-(3,17,). No. 2,332,815. Leopold Ruzicka, to Ciba Pharmaceutical Products.

Effecting sterilization of air laden with bacteria or other pathogenic invaders of the respiratory tract comprising contacting the air with a glycol in vapor form in proportions to effect a substantially instantaneous lethal action on the bacteria in the air. No. 2,333,-124. Oswald Robertson, Benjamin Miller and Edward Bigg.

Halogen acyl derivatives of 4,4'-di-aminodiphenyl sulphone. No. 2,333,394. Horace Shonle and Arthur Van Arendonk to Eli Lilly & Co.

Therapeutic product for the treatment of afflictions of the oral cavity by forming and maintaining a protective pectous coating over area to be treated. No. 2,333,950. Aksel Olsen and Thomas Rector to General Foods Corporation.

1,3,5-Triazinyl-(6)-aminophenyl-arsenic compound. No. 2,334,321. Ernst Friedheim to Parke, Davis & Co.

Sunburn preventive to be applied as a coating to human skin and hair for the purpose of rendering the outer surfaces, after removal of coating, opaque to ultraviolet light comprising a non-toxic carrier having dispersed therein a colorless, fluorescent, basic compound substantive to human skin and hair. No. 2,334,348. John Miglarese to The National Marking Machine Co.

Antigen extract for flocculation testing for the presence of syphilitic reagin including the ether and alcohol soluble and acetone insoluble portions of a mixture of powdered beef heart and egg yolk. No. 2,334,636. Louis Mazzini to Indiana University Foundation.

Metals, Alloys

Preventing the corrosive action of an aqueous alcohol on an aluminum or aluminum alloy container therefor. No. 2,330,525. James Shields to Alox Corp.

Arc welding low-carbon steel with a carbon electrode. No. 2,330,601. Bernard Larsen to U. S. Steel Corp. of Delaware.

Brightening an electro-deposited stannous metal coating on a metal strip. No. 2,330,609. John Nachtman.

Making coated ferrous metal material having a ferrous metal base and a uniformly adhering, perfectly bonded, smooth coating of tin. No. 2,330,608. John Nachtman.

Producing metallic magnesium comprising, the reduction of MgO by C. No. 2,330,724.

Recovering thorium from precipitates which contain thorium and a substantial amount of iron and which have been obtained by treating salt solutions containing said metals with alkaline precipitating agents. No. 2,330,750. Paul Schaller, Ernst Froelecke, Karl Meyer, Otto Roelen, and Robert Luben to Hydrocarbon Synthesis Corp.

Welding pieces of copper, which comprises forming by electro-deposition on a surface of each of said pieces a coating of iron of uniform thickness. No. 2,330,948. Philip Anderson, Jr., and Ralph Major to Servel, Inc.

Treating a finely divided iron ore for improving its suitability for use in a furnace charge, which comprises heating the said ore in finely divided condition and in its natural state sufficiently to substantially completely dehydrate the ore. No. 2,331,074. Russell Jones.

Soldering iron for use with solder containing tin and in which the active part of the iron consists of an alloy of copper and 0.02 to 8% of zirconium. No. 2,331,088. Jan Went, Pieter van Nooyen and Willem van der Moer, vested in Alien Property Custodian.

Protecting a container, the inner surfaces of which are formed of magnesium or magnesium-base alloys, from corrosive attack by water or a water-containing medium. No. 2,331,270. Percy George to The Dow Chemical Co.

Recovering antimony from tetrahedrite concentrate. No. 2,331,395. William Holmes to Sunshine Mining Co.

Polishing stainless iron and steel, an electrolyte for the anodic polishing of stainless iron and stainless steel. No. 2,331,721. James Ostrofsky to Rustless Iron and Steel Corporation.

Effecting concentration of relatively coarse metal containing ore particles of a size of the order of 14 mesh by the flotation process which comprises adding to a mineral pulp a sulfurized sperm oil, and subjecting the resulting mixture to a flotation operation. No. 2,331,722. John Patek to Eastman Kodak Co.

Electrodepositing hard nickel plating. No. 2,331,751. Andrew Wesley to The International Nickel Co. Inc.

Recovering lithium from a lithium-containing mineral which comprises lixiviating the mineral with an aqueous solution of a neutral metal salt containing a substance producing an alkaline reaction. No. 2,331,838. Axel Lindblad and Sven Wallden and Karl Sivander to Bolidens Gruvaktiebolag.

Making an annealable white iron casting which comprising, providing a molten composition containing as essential elements iron, carbon, silicon, copper, and tellurium. No. 2,331,886. Alfred Boegehold to General Motors Corp.

Mining sylvinite from subterranean deposits and recovering potassium chloride wherein a heated solvent liquor unsaturated with respect to potassium chloride is circulated in contact with said subterranean deposit of sylvinite until said liquor becomes more concentrated with respect to potassium chloride. No. 2,331,890. Roy Cross to Kansas City Testing Lab.

Steel alloy which comprises as its alloying elements carbon, molybdenum, chromium, silicon, manganese, and the balance substantially all iron. No. 2,331,899. William Finkl to A. Finkl & Sons Co.

Steel alloy which comprises as its alloying elements carbon, molybdenum, chromium, manganese, silicon, nickel, and the balance sub-

stantially all iron. No. 2,331,900. William Finkl to A. Finkl & Sons Co.

Depositing hot molten metal along a seam between the opposed edges of two juxtaposed metal members to produce a welded joint uniting said members. No. 2,331,937. Norman Schreiner to The Linde Air Products Co.

Water Treating Method of inhibiting or preventing the corrosion of base metals in aqueous solutions. No. 2,332,209. Melvin Enquist.

Process for Briquetting Magnesium and Magnesium alloy scrap. No. 2,332,277. Max Stern.

Recovery of Zinc Dust. No. 2,332,403. James Smail, to Republic Steel Corp.

Composite reagent suitable in production of chromium alloys in the form of an intimate mixture consisting of solid, finely divided calcium chromate solid, finely divided calcium chromite formed by heating calcium chromate to liberate oxygen, and a solid, finely divided non-carbonaceous reducing agent capable of reducing chromium. No. 2,332,415. Marvin Udy.

Case carburized steel article, formed from chromium carburizing steel. No. 2,332,441. Martin Fleischmann to The Timken Roller Bearing Co.

Treating articles of magnesium and its alloys comprising subjecting the article to the action of acid fluoride, and an aqueous solution of an alkali. No. 2,332,487. William Loose to The Dow Chemical Co.

Producing a low-cost self-sustaining fibrous metal bat of uniform light weight and standardized resiliency. No. 2,332,726. William Joyce, Jr., to General Motors Corp.

Processing ores under controlled atmospheric and temperature conditions. No. 2,333,111. Henry Lykken.

Protection from atmospheric corrosion of metallic surfaces susceptible to said corrosion which comprises applying to said surfaces a film of an acyclic aliphatic monoamine having an aliphatic group of a chain length of at least 8 carbon atoms. No. 2,333,206. Clifford Sloan to E. I. du Pont de Nemours & Co.

Production of iron from iron ore in a single shaft of a vertical furnace. No. 2,333,417. Frederick Duffield.

Making steel containing a predetermined carbon content.. No. 2,333,573. Philip Kalischer to Westinghouse Electric & Manufacturing Co.

Electrolytic production of chromates in an electrolytic cell having an anolyte and a catholyte separated by a permeable diaphragm wherein the catholyte becomes depleted in chromate ions and enriched in alkali-metal ions as a result of the electrolytic action. No. 2,333,578. William Knox, Jr., and Richard Kelly to International Smelting & Refining Co.

Treating a molten cast iron which comprises adding to molten iron manganese and metal oxide, the oxide inhibiting the tendency of manganese to form pinholes in iron. No. 2,333,741. David Reeder to Electro Metallurgical Co.

Electrodepositing metal on an article having inner and outer faces to be plated. No. 2,333,907. Roy Werrett to R. A. Lister & Co. Ltd.

Protecting metal surfaces from atmospheric corrosion which comprises applying a slushing oil composition comprising a water-insoluble film-forming mineral oil having dissolved therein a metal salt of a 2,4-dialkyl diphenol sulfide. No. 2,334,071. Elmer Cook and William Thomas, Jr., to American Cyanamid Co.

Surface-hardening an austenitic steel article where surface has been work-hardened by machining, comprising etching the article anodically in an electrolytic bath to replace work-hardened surface by a passive oxide film, etching cathodically to remove passive oxide film, etching cathodically to remove passive film and subjecting the article to a nitriding treatment. No. 2,334,081. Ernest Gadd and Harry Keates to The Bristol Aeroplane Co. Ltd.

Reduction of finely divided metal compounds with a gaseous reducing agent to produce a powder of the metal and a gaseous reaction product that is heavier than the reducing agent. No. 2,334,434. Raymond Patterson to Powder Metals and Alloys, Inc.

Manufacturing metallic magnesium by carbothermic reduction of magnesium oxide-containing prime material and shock-chilling of the resulting magnesium vapor-carbon monoxide mixture while using as coolant in a circuit a liquid inert to magnesium. No. 2,334,451. Edgar Spooner to The Anglo California National Bank of San Francisco.

Heat treating steel comprising a liquid mixture of butanol and nitromethane. No. 2,334,652. Joseph Schmitt to Edna Beekman and Joseph Schmitt.

Distilling tar to produce a heavy creosote oil having a low coke residue. No. 2,334,667. Joseph Zavertnik to Allied Chemical & Dye Corporation.

Paints, Pigments

Varnish comprising reaction product of polymerized rosin and a compound of a metal of group 2 of the pericdic table, which metal forms a water insoluble resinate; and a spirit solvent, said varnish being characterized by water and alkali resistance. No. 2,332,623. Irwin Clar to Hercules Powder Co.

Acid and alkali-resistant green paint comprising a blend of copper phthalocyamine blue pigment and Hansa yellow in an alkyd resin vehicle. No. 2,332,636. Wasson Hose and Paul Zurcher to Patterson-Sargent Co.

Dispersion of hydrophilic pigments. No. 2,333,197. William Reynolds to Interchemical Corporation.

Conditioning paints comprising a liquid vehicle reactive with zinc oxide. No. 2,333,367. Alwin Eide and Harlan Depew to American Zinc, Lead & Smelting Co.

Hydrolytic precipitation of titanic acid directly convertible into rutile by calcination at temperatures below 1000° C. from a sulphuric acid solution containing titanium sulfate and iron sulfate and from a sulfuric acid solution containing titanium and iron. No. 2,333,660. Andrew McCord and Harold Saunders to The Sherwin-Williams Co.

Making an extended pigment which includes nucleaating an ilmenite solution with anatase identical with that prepared by heating a sulfuric acid dispersion of gamma-titanic acid, hydrolyzing said solution in the presence of an extender, separating, washing and calcining the precipitate. No. 2,333,661. Andrew McCord and Harold Saunders to The Sherwin-Williams Co.

Manufacture of titanium dioxide pigments which includes nucleating an ilmenite solution with gamma-titanic acid and hydrolyzing said solution by boiling in presence of an extender. No. 2,333,662. Andrew McCord and Harold Saunders to The Sherwin-Williams Co.

Manufacture of titanium oxide pigments which includes thermally hydrolyzing titanium tetrafluoride to form an anatase, and nucleating a sulfuric acid ilmenite solution with said anatase. No. 2,333,663. Andrew McCord and Harold Saunders to The Sherwin-Williams Co.

Preparation of pigments, finely divided oxides of metals of the group consisting of chromium, silicon, aluminum, zirconium, antimony, zinc, berylium, boron, cadmium, cobalt, molybdenum, nickel, and vanadium. No. 2,333,948. Irving Muskat to Pittsburgh Plate Glass Co.

Air-drying water paint comprising a dispersion of a pigment in a substantially neutral solution of a formaldehyde-urea reaction product. No. 2,334,096. Arthur Howald and Maurice Bigelow to Libbey-Owens-Ford Glass Co.

Paper, Pulp

Making coated paper having a non-cast surface, which comprises applying fluid aqueous coating composition to a web of paper, pressing the coated side of the paper while the coating is wet, against a solid surface carrying liquid film substantially immiscible with fluid coating composition, and separating the web from surface after coating composition has partially dried to form layer. No. 2,331,922. William Montgomery to The Champion Paper & Fibre Co.

Processing refined chemical pulp containing not more than 0.15% ether extractable matter into viscose by adding anion active agents. No. 2,331,935. Paul Schlosser, Kenneth Gray and Earl Hallonquist to Rayonier Incorporated.

Refined chemical pulp product containing not more than 0.15% of natural ether extractable matter having incorporated a cation active quaternary ammonium compound dispersible in, whose cation is stable in, solutions of alkyl metal hydroxide. No. 2,331,936. Paul Schlosser and Kenneth Gray to Rayonier Incorporated.

Sulfur-surfacing paper which consists in bringing sulfur to molten state, spreading it upon surface of printing block and impressing outspread film with penetration into fibre of the paper upon surface of paper. No. 2,331,951. Burchard Wright and Paul McKinney. McKinney to Texas Gulf Sulphur Co.

Producing a paper of improved fold and strength which comprises adding to an aqueous suspension of hardwood pulp delignined by sulfite process, a mixture of petroleum oil and an emulsifier the amount of petroleum oil added ranging from ¼ to 1% by weight based on the dry weight of the delignined hardwood pulp. No. 2,332,226. Leslie Hutchins, to Standard Oil Development Co.

Manufacturing vegetable fiber structural units. No. 2,332,369. John Burton to Minnesota and Ontario Paper Co.

Filled paper, comprising fibrous material alkaline filler in intimate association therewith, and a substantially water-insoluble copper compound resulting from ineraction, in the presence of water, of a substantially water-soluble copper compound and a size selected from the group consisting of rosin sizes and fatty acid sizes. No. 2,332,750. Joseph Plumstead to Raffoid Process Corp.

Coated container wall of fiber board, comprising water-dispersed clay and adhesive and in association therewith a coating of polyvinyl alcohol and starch. No. 2,333,023. Willard Manor to Consolidated Paper Co.

Safety paper including a base, and a coating having a mineral filler including clay and calcium cabenate, a binder, and a color changing agent of the benzidine group chemically neutralized with phosphoric acid. No. 2,333,979. Rexford Bradt to Fox River Paper Corp.

Petroleum Chemicals

Continuous isomerization of normal paraffin hydrocarbons by contact with a catalyst comprising a metallic halide. No. 2,330,754. William Skelton, Eugene Sensel, and Arthur Goldsby to The Texas Co.

Isomerizing normal pentane which comprises subjecting the same in the liquid phase to the action of aluminum chloride and sulfur dioxide. No. 2,330,761. Carl Tongberg to Standard Oil Development Co.

Producing isoparaffins, particularly isobutane and isopentane, by isomerization of the normal paraffin. No. 2,330,787. Stanley Birch and John Beynon to Anglo-Iranian Oil Co. Ltd.

Olefin polymers containing a chemically combined metal and chemically combined sulfur and oxyygen obtained by treating with elemental sulfur and an oxygen-containing material in the presence of a metal compound. No. 2,330,900. Clarence Loane and James Gaynor to Standard Oil Co.

White refined paraffin wax product, inhibited against the formation therein of deleterious color upon prolonged exposure to light. No. 2,331,469. Lyle Hamilton and Robert Moran and Albert Cattell to Socony-Vacuum Oil Co. Inc.

Conversion of natural gasoline containing propane and normal butane. No. 2,330,206. Charles Dryer and Ralph Thompson to Universal Oil Products Co.

Improved process for converting normal paraffins to isoparaffins comprising subjecting the normal paraffins containing at least four carbon atoms per molecule in the absence of any substantial amounts of olefins to the action of a Friedel-Crafts type catalyst modified with an alkali metal halide to form a double salt complex. No. 2,332,275. Eldon Stahly to Standard Oil Development Co.

Reacting a hydrocarbon mixture containing isoparaffins and olefins to produce normally liquid, branched chain hydrocarbons, a substantial amount being paraffinic in nature. No. 2,332,276. Eldon Stahly, to Standard Oil Development Co.

Production of alkylated hydrocarbons which comprises reacting a hydrocarbon having a tertiary carbon atom with an olefin in the liquid phase under pressure of at least 1000 atmospheres in a reaction zone. No. 2,332,321. Karl Korpi, Union Oil Co.

Conversion of hydrocarbons, which comprises subjecting a normal paraffin fraction to contact with a metal halide catalyst under isomerizing conditions of temperature and pressure and in the

presence of hydrogen and hydrogen halide to form branched-chain paraffin. No. 2,332,577. Louis Kassel to Universal Oil Products Co.

Treating cracked gasoline to prevent depreciation thereof which comprises adding a phenolic gum inhibitor and another compound. No. 2,333,294. Joseph Chenicek to Universal Oil Products Co.

High antiknock motor fuel comprising a base fuel consisting essentially of isoparaffinic motor fuel hydrocarbons produced by alkylation of isoparaffins with normally gaseous olefins and an ester selected from group consisting of saturated aliphatic esters of formic acid and acetic acid. No. 2,334,006. Melvin Holm to Standard Oil Co. of California.

Petroleum Refining

Lubricating composition comprising at least 80% refined mineral lubricating oil with the gum solvent properties of such composition improved by incorporating therein an oil-soluble halogen-bearing hydrocarbon and an oil-soluble organic oxygen compound. No. 2,330,238. Carl Prutton to The Lubri-Zol Development Corp.

Liquid lubricating composition comprising a major proportion of mineral lubricating oil and an oil-soluble salt of an aromatic acid. No. 2,330,239. Carl Prutton to The Lubri-Zol Corp.

Breaking petroleum emulsions of the water-in-oil type, which consists in subjecting the emulsion to the action of a demulsifying agent comprising a 4:4'-di-(polyethylene glycoxy-cyclohexyl) dimethyl methane. No. 2,330,474. Melvin De Groote to Petrolite Corp., Ltd.

Cracking petroleum oil to produce motor fuel having high anti-knock properties using a metal oxide catalyst in the form of an aerogel. No. 2,330,640. John Teter to Sinclair Refining Co.

Recovering distillate from natural gas contained in same at presures in excess of 1,500 lbs./sq. in. No. 2,330,676. Stuart Buckley to Standard Oil Development Co.

Production of a catalyst suitable for the cracking and reforming of petroleum oils boiling in the motor fuel and gas oil ranges. No. 2,330,685. Gerald Connolly to Standard Oil Development Co.

Treatment of petroleum hydrocarbons containing mercaptans and corrosive sulfur. No. 2,330,735. Henry Paulsen to Standard Oil Development Co.

Removal of waxy constituents from waxy petroleum oils and for the segregation of said waxy constituents into various melting point fractions. No. 2,330,740. Oldrich Pokorny and Herbert Moor to Standard Oil Development Co.

Treating a soil sample for the recovery therefrom of a gas to be analyzed for the presence therein of constituents significant of subterranean petroliferous deposits. No. 2,330,758. Millard Taggart to Standard Oil Development Co.

Dehydrogenating aliphatic hydrocarbons which comprises passing same at a temperature above 1000° F. over a catalyst comprising a phosphomolybdic acid. No. 2,330,804. Robert Atkinson to The Shamrock Oil and Gas Corp.

Distilling crude petroleum to separate a residue from a lighter fraction. No. 2,330,816. du Bois Eastman and Joseph Barron to The Texas Co.

Recovery of phenolic compounds from petroleum by heating a petroleum oil containing sulfur compounds, phenols, and carboxylic acids while in the presence of a caustic alkali to a temperature at which a fraction lighter than gas oil and containing phenols and sulfur compounds is vaporized while said carboxylic acids are converted into alkali metal soaps stable at such temperature. No. 2,331,034. Arthur Lazar and Thomas McCormick to Tide Water Associated Oil Co.

Hydrocarbon oil conversion process which comprises cracking a hydrocarbon oil to form vaporous and liquid conversion products, separating resulting cracked vapors from non-vaporous liquid residue, fractionating said cracked vapors to condense and separate selected relatively low and relatively high boiling reflux condensates. No. 2,331,069. Gustav Egloff to Universal Oil Products Co.

Making motor fuel of gasoline type from mineral oil, the steps comprising cracking a portion of mineral oil to convert a part thereof into gasoline-type motor fuel, fractioning the product to separate out the lighter gasoline portion. No. 2,331,121. Joseph James to Clarence Byrnes.

Gasoline motor fuel comprising a hydrocarbon distillate boiling between 65-205° C. and a meta-dioxane boiling within the gasoline boiling range. No. 2,331,158. Erving Arundale and Louis Mikeska to Standard Oil Development Co.

Recovery and segregation of various naturally-occurring acidic oxygen containing compounds from petroleum oils, which comprises contacting feed petroleum oils containing these compounds with a solid reagent consisting substantially of a highly porous synthetic silica gel. No. 2,331,244. Barney Strickland to Standard Oil Development Co.

Cracking a hydrocarbon oil in the presence of a catalyst obtained by heating an initially moist non-alkaline mixture of silica hydrogel and at least one catalytically acting metal compound. No. 2,331,338. Wilhelm Michael, Otto Goehre, Gerhard Free and Wilhelm Fuener and Wilhelm Schneider.

Removing objectionable sulfur compounds from petroleum oils. No. 2,331,343. Gerald Phillips to Standard Oil Development Co.

Catalytically cracking hydrocarbon oils. No. 2,331,353. Fritz Stoewener and Emil Keunecke and Friedrich Becke.

Endothermic conversion of hydrocarbons by a one-pass operation at substantially constant feed rate over a contact catalyst. No. 2,331,427. Walter Schulze, Graham Short, and Carl Helmers to Phillips Petroleum Co.

Improving the antiknock value of petroleum naphtha wherein the naphtha is subjected to contact with an isomerization catalyst to effect substantial conversion of hydrocarbon constituents of the naptha into hydrocarbons of more branched chain character. No. 2,331,429. Eugene Eensel and Arthur Goldsby to The Texas Company.

Catalytic conversion, cracking heavier petroleum oil to gasoline. No. 2,331,433. Thomas Simpson, John Payne, and John Crowley, Jr., to Socony-Vacuum Oil Co. Inc.

Refining light hydrocarbons, such as gasoline, containing unstable, unsaturated hydrocarbons. No. 2,331,438. William Stratford to The Texas Company.

Conversion of higher boiling hydrocarbons into normally liquid hydrocarbons of lower boiling point. No. 2,331,930. Mathias Pier, Kurt Peters and Gerhard Free vested in the Alien Property Custodian.

Converting hydrocarbons for the production of hydrocarbons of high antiknock value in pipe still furnace. No. 2,332,051. David Brandt to Cities Service Oil Co.

Recovering desirable liquefiable constituents from gas which is initially at a high pressure substantially above the range of pressure in which said constituents undergo retrograde condensation. No. 2,332,201. Stuart Buckley, to Standard Oil Development Co.

Removal of waxy constituents from petroleum oils. No. 2,332,284. Mehemet Wiggen to Standard Oil Development Co.

Conversion of hydrocarbon oil, which comprises adding fresh powdered siliceous cracking catalyst to said oil. No. 2,332,562. Gustav Egloff to Universal Oil Products Co.

Converting hydrocarbons to produce therefrom high yields of good antiknock gasoline. No. 2,332,563. Gustav Egloff to Universal Oil Products Co.

Producing substantially saturated gasoline, which comprises commingling a low boiling isoparaffinic fraction with a metal halide alkylating catalyst. No. 2,332,564. Gustav Egloff to Universal Oil Products Co.

Converting higher boiling hydrocarbons into lower boiling hydrocarbons suitable for motor fuel. No. 2,332,794. Ralph Hill, to Standard Oil Development Co.

Handling of low boiling hydrocarbons, in admixture with substantial quantities of air produced in the breathing of gasoline storage tanks. No. 2,332,814. Walter Rupp to Standard Oil Development Co.

Hydrocarbon conversion, producing a blended high octane number gasoline. No. 2,332,924. Robert Marschner to Standard Oil Co.

Improved diesel fuel, having in admixture a minor proportion of the sulfur and chlorine-containing reaction product obtained by reacting perchloromethylmercaptan with another compound. No. 2,333,029. Edwin Nygaard to Socony Vacuum Co.

Heating of fluids. No. 2,333,331. Irving Oberstad to Universal Oil Products Co.

Conversion of a hydrocarbon distillate such as gasoline, naphtha and the like into high yields of substantially paraffinic gasoline of improved antiknock value. No. 2,333,625. Charles Angell to Universal Oil Products Co.

Purifying a normally liquid hydrocarbon mixture containing as an impurity a relatively small percentage of organically combined fluorine to remove fluorine therefrom, which comprises treating said mixture with substantially anhydrous aluminum fluoride. No. 2,333,648. Aristid Grosse and Carl Linn to Universal Oil Products Co.

Breaking petroleum emulsions of the water-in-oil type, characterized by subjecting the emulsion to the action of a demulsifying agent. No. 2,333,769. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.

Diesel fuel removing existent and lateral oil-insoluble impurities in nitrated fuel oils. No. 2,333,817. Wayne Proell to Standard Oil Co.

Separating normally gaseous olefins from a mixture thereof with corresponding paraffins. No. 2,333,856. Clarence Gerhold to Universal Oil Products Co.

Process for the conversion of hydrocarbon oil. No. 2,334,159. Bernard Friedman to Universal Oil Products Co.

Conversion of hydrocarbon oils the process that comprises subjecting hydrocarbon oil to thermal cracking in a heating zone and a communicating reaction zone maintained under a superatmospheric pressure and wherein separation of vapors from liquid residue takes place. No. 2,334,306. Joseph Barron to The Texas Co.

Continuous process for recovering residual tars and oils removed from a petroleum oil coking chamber during blowdown of said chamber. No. 2,334,341. Parker Malson to Shell Development Co.

Refining cracked hydrocarbon distillate of such composition that such distillate is rendered unstable and of higher boiling range by treatment with sulfuric acid. No. 2,334,378. Carl Berger to Globe Oil & Refining Co.

Refining oil soluble petroleum sulfonates. No. 2,334,532. Francis Archibald to Standard Oil Development Co.

Converting heavvy petroleum oil into vapors and coke. No. 2,334,583. Edward Reeves to Standard Oil Development Co.

Photographic Chemicals

Soluble photographic layer of colloidal gums process of conditioning such gums for such use. No. 2,330,905. Fritz Mueller to General Aniline & Film Corp.

Treatment of lithographic printing plates bearing a printing image thereon and to provide a film over said plates for protection during periods of non-use. No. 2,331,245. Hugo Stockmayer to General Printing Ink Corp.

Light, sensitive photographic emulsion containing as a color former a compound selected from the class consisting of esters, amides and substituted amides of a-coumarilyl acetic acid, substituted a-coumarilyl acetic acid, thionaphthenyl-a-acetic acid and substituted thio-naphthenyl-a-acetic acid. No. 2,331,326. John Kendall and Ronald Collins to Ilford Limited.

Solution for use in the production of films, foils, filaments and the like comprising zein dissolved in a solvent mixture consisting of ethylene formal and methyl alcohol, said solution containing urea and formaldehyde. No. 2,331,434. Richard Sitzler to Celanese Corp. of America.

Process and material for printing photographic images, a composite picture record comprising at least two part records in superposed planes and a luminescent substance uniformly distributed over the total picture area. No. 2,331,492. Walter Michaelis to Chromogen, Inc.

Preparing a dye-sensitized mixed-grain photographic silver halide emulsion in which diffusion of the sensitizing dye is retarded. No. 2,331,660. Edward Davey to Eastman Kodak Co.

Differentially fixing out silver halides. No. 2,331,678. Wesley Hanson, Jr., to Eastman Kodak Co.

Thin, transparent, cellulose organic acid ester sheeting having on at

least one surface an adherent deposit of fine, discrete particles of prolamine, free from plastic binder, whereby cohesion and static accumulation by the sheeting are prevented. No. 2,331,715. Gale Nadeau and Edwin Hilborn to Eastman Kodak Co.

Nonreflecting coating. No. 2,331,716. Gale Nadeau and Edwin Hilborn to Eastman Kodak Co.

Photographic film having low dye retention subbing layers, comprising a cellulose ester support, an emulsion layer adapted to receive a colored image, and between the emulsion and the support a subbing layer composed of a mixture of gelatin and a polymeric material. No. 2,331,717. Gale Nadeau and Clemens Starck to Eastman Kodak Co.

Light-sensitive photographic film which comprises a cellulose ester support, an emulsion layer, and on the opposite side of the support, two layers of a synthetic colloidal film forming material of different composition than the support. No. 2,331,739. Norwood Simmons to Eastman Kodak Co.

Antiabrasion coating for photographic film comprising a developed, fixed, washed, and dried photographic film having a coating of a cellulose ether containing a dicarboxylic acid radical. No. 2,331,746. Ralph Talbot to Eastman Kodak Co.

Silver halide emulsion for color photography which comprises uniformly dispersing in a silver halide emulsion a non-coupling non-diffusing water-soluble resinous dye formed by union of a formaldehyde with an azo dye. No. 2,331,755. Richard Young to Eastman Kodak Co.

Photographic element comprising a support, a layer on the support which is capable of being rendered luminescent under suitable activation, a sensitive layer overlying said layer, and a water-permeable layer between the sensitive layer and the first named layer. No. 2,332,038. Clarence Wynd and Gerould Lane to Eastman Kodak Co.

Making a zinc half-tone printing plate, the steps of impressing an image through a half-tone screen on a zinc plate coated with a light sensitive emulsion to which has been added a small proportion of ferric ammonium citrate. No. 2,333,020. Adrian LeRoy and Jeannette LeRoy to Lectrocut Corp. Ltd.

Production of photographic dyestuff images which comprises developing a reducible silver salt image with an aromatic amino color-developing agent in the presence of a color-former. No. 2,333,106. John Kendall and Douglas Fry to Ilford, Limited.

Producing a reversed dye-image from a silver image within a developed photographic layer. No. 2,333,126. Laszlo Schwarc to Chromogen, Inc.

Desensitizing etch for lithographic plates which is capable of producing a water-attracting surface, consisting of a mixture of basic chromium sulfate, phosphoric acid, gum arabic and water. No. 2,333,221. Paul Whyzmuzis to Interchemical Corp.

Photographic process for producing a plurality of images in a single emulsion layer having an initially light-sensitive silver compound. No. 2,333,359. Albert Bunting to Union Research Corp.

Antihalation photographic film comprising a cellulose ester support having on one side a light-sensitive emulsion layer and on opposite side an antihalation layer of a cellulose organic acid ester permeable but not soluble in photographic processing solutions, containing a surface-active agent and a light-absorbing material. No. 2,333,809. Gale Nadeau and Alfred Slack and Clark Smith to Eastman Kodak Co.

Processing an exposed photographic emulsion of silver halide dispersed in a cellulose ethyl ether having an ethoxyl content and free of gelatin. No. 2,333,821. Martin Salo and John Mench to Eastman Kodak Co.

Light-sensitive tracing cloth comprising a sized cloth base, a single waterproofing layer of gelatin and cellulose ester and containing cellulose ester, and a light sensitive layer over the waterproofing layer. No. 2,334,215. Gale Nadeau and Carl Smith to Eastman Kodak Co.

Forming printing plates from plastic materials. No. 2,334,233. Otis F. Wood, deceased, Elizabeth Wood Distler, administratrix.

Making deep-etched lithographic plates. No. 2,334,405. Anthony George to The Lithographic Technical Foundation, Inc.

Light-sensitive photographic emulsion containing as a color former a compound selected from the class consisting of the esters, amides and substituted amides of compounds. No. 2,334,495. John Kendall and Ronald Collins to Ilford Limited.

Resins, Plastics

Manufacture of the phenol-aldehyde type of resins. No. 2,330,217. James Hunn to The Sherwin-Williams Co.

Making a web of thermoplastic material having polished surfaces. No. 2,330,282. Benjamin Hazeltine to Monsanto Chemical Co.

Stabilizing tall oil. No. 2,330,792. Anthony Oliver and Robert Palmer to Newport Industries, Inc.

Naphthalene-formaldehyde-phenol resin, obtained by heating and reacting a phenol with a naphthalene formaldehyde condensation product, the said composition being soluble in vegetable drying oil. No. 2,330,827. Ernest Kester to Koppers Co.

Polystyrene resinous composition consisting essentially of a polymerized vinyl aromatic compound. No. 2,331,273. Robert Lowry to The Dow Chemical Co.

Plastic composition comprising a polyvinyl acetal resin and an ester of a hydroxycyclohexanone. No. 2,331,328. Lucas Kyrides to Monsanto Chemical Co.

Plastic substance embodying a plurality of C—O—C linkages and selected from the group consisting of cellulose esters and cellulose ethers, and having as a modifier therefor a carboxylic acid ester of a hydroxycyclohexanone. No. 2,331,330. Luca Kyrides to Monsanto Chemical Co.

Plastic composition which comprises cellulose acetate and a cyclic ketal from glycerol and an aliphatic cyclic monoketone. No. 2,331,614. Kenneth Marple and Franklin Bent to Shell Development Co.

Synthetic resin, a reaction product of an alcohol and a conjoint condensation product of the simultaneous reaction of a mixture of reactants. No. 2,331,805. Paul Scrutchfield to Hercules Powder Co.

Catalyst for acid-curing thermosetting resins. No. 2,331,862. Norman Shepard to American Cyanamid Co.

Resinous condensation product obtained by condensing an alkylolurea containing at least two carbon atoms in an alkylol radical with formaldehyde. No. 2,331,926. John Olin to Sharples Chemicals, Inc.

Rigid abrasive body comprising abrasive grains bonded with resin bond at least 50% of which is formed by condensing in the presence of a strong acid mixture of aniline and triazine. No. 2,332,235. Samuel Kistler to Norton Co.

Vinylidene Chloride Fibers produced by subjecting a plurality of filaments of a normally crystalline vinylidene chloride polymer in the supercooled state to the simultaneous operations of stretching and false twisting. No. 2,332,485. Alden Hanson Dow Chemical Co.

Frabrication of crystalline polymers which comprises twisting a supercooled strand of a normally crystalline vinylidene chloride polymer. No. 2,332,489. Robert Reinhardt and Leonard Chemberlain, Jr., to The Dow Chemical Co.

Flexible Fiber Composition. No. 2,332,792. Edward Gross and Albert Hanley to Bakelite Corp.

Water soluble urea-formaldehyde type of resin product, containing a slight amount of free formaldehyde. No. 2,332,801. Carl Leonardson and Donald White, The Borden Co.

Water soluble urea-formaldehyde type of resin product. No. 2,332,802. Carl Leonardson and Donald White, to The Borden Co.

Plasticizing and thermally stagilizing polyvinyl chloride which comprises incorporating therein an aliphatic ester of diacetoxy steric acid. No. 2,332,849. Wolfgang Gruber and Hans Machemer.

Co-polymer of vinyl chloride and vinyl acetate containing a proportion of vinyl chloride. No. 2,332,974. Marion Lytton, and Robert Taylor to American Viscose Corp.

Plastic bituminous insulating composition comprising a normally solid bituminous base, a volatile solvent for the bituminous base, and a filler. No. 2,333,189. Orville V. McGrew.

Polyvinyl halide composition comprising a polymer made from a monomeric material consisting of vinyl chloride, a plasticizer, and a member of the class consisting of alkali metal hypochlorites, alkaline earth metal hypochlorites, and tertiary alkyl hypochlorites. No. 2,333,280. Harold Tucker to The B. F. Goodrich Co.

Molding composition suitable for non-yellowing molded articles which comprises a urea-formaldehyde resin, cellulose pulp and titanium dioxide. No. 2,333,396. Charles Stock to American Cyanamid Co.

Diamond abrasive body comprising diamond abrasive grain bonded with a B stage synthetic resin of the phenol-aldehyde type cured to the C stage. No. 2,333,429. Paul Kuzmick to J. K. Smit & Sons, Inc.

Plastic, moldable, fire-resisting composition suitable for an insulating member. No. 2,333,513. Leo Berberich and Jack Swiss to Westinghouse Electric & Manufacturing Co.

Plastic composition comprising ethyl cellulose and a phenol having a carbon linkage para substituent and an oxygen linkage ortho substituent as a stabilizer therefor. No. 2,333,577. William Koch to Hercules Powder Co.

Protecting plastics during curing or molding, which comprises providing a protective medium between molding surface and plastic to be molded by applying to molding surface a film comprising an insoluble salt of alginic acid. No. 2,333,679. Irl Schoonover and George Dickson to the Government of the United States.

Manufacture of mixed resins for cation exchange. No. 2,333,754. Hans Wassenegger.

Production of molding mixtures from heat-hardenable synthetic resins and filling substances. No. 2,333,786. Richard Hessen.

Preparing a polyvinyl acetaldehyde acetal resin free from hydroxyl groups. No. 2,333,796. William Kenyon and Wendell McDowell to Eastman Kodak Co.

Preparing a pure white polyvinyl acetal resin. No. 2,333,804. Carl Malm and Martti Salo to Eastman Kodak Co.

Manufacturing molded articles from an artificial mass composed predominantly of a water-insoluble thermoplastic material. No. 2,333,816. Hans Pohle and Paul Weikart to Winthrop Chemical Co. Inc.

Plywood binder, a casein-resin composition comprising casein and a resinous distillate obtained in the distillation of a petroleum fraction containing substantial quantities of cyclic constituents. No. 2,334,270. Edwin Knowles and Frederic McCoy to The Texas Co.

Plasticizing rubber-like materials which comprises preparing a plasticizer by the process consisting essentially in extracting a petroleum feed oil derived from an aromatic type crude. No. 2,334,582. Chester Read to Jasco, Inc.

Rubber

Making a rubber article from an aqueous dispersion of a rubbery material. No. 2,330,351. Merrill Hansen to American Anode, Inc.

Compounding carbon black into rubber. No. 2,330,698. Harold Fisher to Jasco, Inc.

Rubber compositions containing a large proportion of an acid treated, impingement carbon black carrying an added water soluble acid, the amount of acid being less than 1% based on the black, said carbon black having a reduced pH value and improved properties as compared with the untreated carbon black. No. 2,331,199. Robert King nad William Mitchell, Jr., to King & Lang, Inc.

Production of chlorinated rubber hydrochloride of high total combined chlorine content, with high reaction efficiency. No. 2,331,327. Walter Kutz to The Raolin Corp.

Production of goods of or containing rubber composition from aqueous dispersions which comprises admixing dispersions with a sodium hydrofluosilicate and a water soluble non-coagulating salt of the group consisting of sodium chloride and potassium chloride. No. 2,331,519. Douglas Twiss and Philip Amphlett to Dunlop Tire & Rubber Corp.

Laminating rubber hydrochloride films to wax-containing rubber hydrochloride films by heat and pressure to produce a laminated sheet of wax-containing rubber hydrochloride and rubber hydrochloride which is substantially wax free. No. 2,331,742. James Snyder to Wingfoot Corp.

Synthetic rubber composition capable of developing tack when brushed with an organic solvent. No. 2,331,979. Donald Henderson to The B. F. Goodrich Co.

Preventing film formation in production of chlorinated rubber containing above 64 per cent fixed chlorine. No. 2,331,985. Walter Kuts and George Webb to The Raolin Corp.

Preparing a rubberlike composition of matter comprising the steps of polymerising a mixture of isoolefinic and diolefinic materials. No. 2,332,194. Nathan Beekley, Jr., and William Sparks, to Standard Oil Development Co.

Imparting tack to an unvulcanized synthetic rubber prepared by copolymerizing in aqueous emulsion a mixture of butadiene-1,2 and acrylonitrile containing between about 25 and 45% of acrylonitrile. No. 2,332,268. Donald Sarbach The B. F. Goodrich Co.

Increasing the plasticity of rubber which comprises, milling unvulcanized rubber with a small amount of a compound, for a time sufficient to effect increase in plasticity of rubber over that which rubber would have if subjected to the same conditions in absence of said compound. No. 2,332,401. Richard Roblin to American Cyanamid Co.

Extensible elastic sheet material, equally extensible in all directions consisting of an elastic vulcanized rubber sheet and a ply of stretchable textile fabric integrally connected thereto. No. 2,332,-848. Josef Grabee.

Manufacturing an oil-proof rubber-like material, which comprises mixing ethylene chloride which has the formula C2H4Cl2 with the tetrasulphide of sodium ethylate. No. 2,332,869. Tadao Okita.

Reducing the water content of rubber latex, which comprises contacting the latex with dry, insoluble, absorbent, plant seeds and separating the seeds from the latex after water has been absorbed by said seeds. No. 2,332,902. Arend D'angremond and Otto Bertram Schrieke.

Composite filter medium, comprising a sheet of perforate rubber, a sheet of open mesh fabric piled thereto, and a rubber adhesive securing said sheets together. No. 2,332,917. Hubert Jordan and George Shriver to United States Rubber Co.

Rubber Mixture, composed of calcium hydroxide a compound from the group consisting of the borates and carbonates soluble in the hydroxide and an aqueous dispersion of rubber. No. 2,333,032. David Pelton Moore to X-L Chemicals Inc.

Producing a rubber hydrohalide from rubber. No. 2,333,214. Charles Thomas and Herbert Morris to Monsanto Chemical Co.

Water mastication of a rubbery copolymer of butadiene-1,3 and a lesser amount of an acrylic nitrile. No. 2,333,242. Charles Fryling to The B. F. Goodrich Co.

Rubber composition of rubber latax; distilled water; a vegetable rubber latex-water diffusing agent composed of a gum solution. No. 2,333,265. Alan McIntosh and Harry Pfaff.

Plastic, rubber-like interpolymer of butadiene-1,3 and an ester of methacrylic acid made by polymerizing butadiene-1,3 and an ester of methacrylic acid in the presence of selenium, tellurium, and mixtures of these two elements. No. 2,333,405. Mortimer Youker to E. I. du Pont de Nemours & Co.

Preparing an artificial dispersion of rubber. No. 2,333,420. Donald Fowler to Dispersions Process, Inc.

Vulcanizing rubber which comprises heating rubber and sulfur in the presence of a thiocarbamyl primary amino sulfide. No. 2,333,-468. Robert Cooper to Monsanto Chemical Co.

Manufacture of rubber threads. No. 2,333,699. Albert Brosi to United States Rubber Co.

Phenol rubber polybutene composition comprising essentially polymer of isobutylene and wax, being a reaction product of rubber and at least one phenol which is resinous, thermoplastic, benzene soluble, acid resistant and alkali resistant, does not adhere to rubber, has an impact strength similar to phenol aldehyde resins, and imparts a hardness to rubber like glue. No. 2,333,730. James Mitchell to E. I. du Pont de Nemours & Co.

Devulcanizing rubber by subjecting whole tire scrap separately to the action of a thiophenol to devulcanize rubber and to action of dilute aqueous solution of sodium hydroxide to destroy fabric in the rubber. No. 2,333,810. Arthur Neal and James Schaffer to E. I. du Pont de Nemours & Co.

Making more rubber-like a wax-like, further polymerizable polyester-amide containing in substantial amount both carboxylic ester and carboxylic amide linkages. No. 2,333,923. Hugh Gray to E. I. du Pont de Nemours & Co.

Vulcanizing rubber which comprises vulcanizing the rubber in the presence of an accelerator. No. 2,334,042. Winfield Scott to Wingfoot Corp.

Anti-flex-cracking agent rubber compositions which comprises incorporating as an anti-flex-cracking agent a phenol, the position para to the phenolic hydroxyl group being occupied by a tertiary alkyl group. No. 2,334,470. Robert Armstrong to United States Rubber Co.

Laminated rubber hydrohalide and cellulose acetate tape. No. 2,334,-585. Gustave Schieman to International Plastic Corp.

Vulcanization of rubber in the presence of a 2-mercaptothiazoline salt of a hydrocarbon substituted guanidine in which those free valences which are not occupied by hydrocarbon groups are occupied by hydrogen. No. 2,334,650. Paul Jones and Roger Mathes to The B. F. Goodrich Co.

Textiles

Improving the filtering properties of viscous solutions of organic derivatives of cellulose, which comprises adding a fibrous material. No. 2,330,211. Clifford Haney to Celanese Corporation of America.

Fire-proofing textile materials having a basis of an organic derivative of cellulose. No. 2,330,251. William Taylor, Henry Olpin and Kenneth House to Celanese Corporation of America.

Textile materials of improved hand and fire resistant properties, said materials having a basis of an organic derivative of cellulose selected from the group consisting of cellulose esters and cellulose ethers and containing tri-chlor-ethyl-phosphate as the sole plasticizing and fire-retarding agent. No. 2,330,254. William Whitehead to Celanese Corporation of America.

Preparation of a soft, porous, felt-like, non-woven web of fibers having a high wet strength from a soft, porous, felt-like, non-woven web of fibers of a low wet strength. No. 2,330,314. George Schwartz to E. I. du Pont de Nemours & Co.

Production of pattern effects on acetate rayon which has been delustred by means other than insoluble delustring inorganic compounds, by local relustring. No. 2,330,707. Richard Hardacre to Imperial Chemical Industries, Ltd.

Producing novel color effects in a textile fabric containing fibers selected from the class consisting of cellulose and regenerated cellulose fibers by altering the capacity for dyes of at least part of said fibers by increasing affinity thereof for acetate dyes and decreasing affinity thereof for direct dyes, which comprises impregnating at least part of said fibers with a solution. No. 2,330,775. Louis Bock and Alva Houk to Rohm & Haas Co.

Spinning jet connection for facilitating the attachment of a spinning jet filled with liquid to a source of supply of spinning solution. No. 2,330,932. William Taylor and William Pool to Celanese Corp. of America.

Treating aircraft fabrics by attaching a textile fabric to a structural framework of an aircraft, applying water and a mildew-proofing agent to the fabric to shrink and, after the fabric has shrunk and dried, applying a protective coating to the exposed surface of the fabric. No. 2,330,998. Leo Roon to Roxalin Flexible Finishes, Inc.

Stabilized textile finish comprising a member of the group consisting of higher fatty acid glycerides and sulfonated higher fatty acid glycerides together with stabilizing amounts of a metal bisulfite-formaldehyde addition compound. No. 2,331,579. Harold Stiegler and John Hood to American Cyanamid Co.

Treating a fabric wheel which consists in impregnating the fabric of said wheel with tricresyl phosphate carried suspended in a water solution of silicate of soda. No. 2,331,583. Robert Twyning to J. C. Miller Co.

Conditioning yarn composed of or containing cellulose acetate to render it amenable to textile operations which comprises applying a lubricating and antistatic composition containing lubricating and anti-static component N-oleyl taurine ammonium salt. No. 2,331,-664. Joseph Dickey to Eastman Kodak Co.

Sizing textile fibers prior to weaving which comprises treating the fiber with a composition comprising mineral oil and a material selected from the group consisting of rosin alcohols, ethers of rosin alcohols and esters of rosin alcohols. No. 2,331,840. Julius Little to Hercules Powder Co.

Making coated flexible materials for use as headlinings, raincoats and the like. No. 2,331,977. William Hedges, John Lowman and Thomas Kerr to Columbus Coated Fabrics Corp.

Preparing nitrogenous cellulose derivatives on water-insoluble cellulosic materials in the form of fabrics, yarns, fibers, battings, sheets, and strips. No. 2,332,047. Louis Bock and Alva Houk to Rohm & Haas Co.

Textile printing paste comprising an emulsion having a discontinuous phase comprising a solution of water-insoluble cellulose ether in volatile water-immiscible organic solvent, and continuous phase comprising an aqueous solution. No. 2,332,121. William W. Trowell, to Hercules Powder Co.

Art of combing unoiled wool, with a Noble type comb by supplying a small amount of wool lubricating oil to the circle pins of the comb. No. 2,332,702. Colver Dyer to Monsanto Chemical Co.

Finishing textile materials, wherein a textile finish is applied to the material as a positively charged aqueous dispersion from a dilute aqueous suspension by a process of exhaustion, and wherein the finish exhausts onto the textile material at too rapid a rate to give a finish of the desired uniformity. No. 2,332,817. Joseph Smith, to E. I. du Pont de Nemours Co.

Manufacturing a fabric article comprising synthetic linear condensation polyamide fibers. No. 2,333,160. George Dunn to Paramount Textile Machinery Co.

Textile treating chemical, reaction product of a mixture comprising formaldehyde, a nitrile, an acid chloride and a tertiary amine. No. 2,333,623. John Rust to Montclair Research Corporation.

Making composite fabric which comprises knitting through a base sheet containing vulcanizable material, and thereafter effecting vulcanization of material to extent desired. No. 2,333,630. Roy Amidon to Vanity Fair Mills, Inc.

Conditioning cellulose acetate yarn to render it more amenable to textile operations including knitting, weaving, spinning, and the like by applying a lubricating and softening composition containing lubricating and softening component triethanolamine monoacetate dipropionate. No. 2,333,770. Joseph Dickey and James Normington to Eastman Kodak Co.

Flexible fabric material having a base coating of synthetic linear polyamide and having applied over said base coating a coating of a composition which comprises the reaction product of an organic polyisocyanate with a linear polyester-amide. No. 2,333,917. Robert Christ and William Hanford to E. I. du Pont de Nemours & Co.

Fabric towel adapted for cleaning glass surfaces containing tetrasodium and tetrapotassium pyrophosphates. No. 2,333,919. Marcellus Flaxman to Union Oil Co. of California.

Bleaching textile goods which comprises impregnating said goods with an aqueous alkaline solution of a peroxygen compound. No. 2,334,066. Donald Campbell and Francis Fennell to E. I. du Pont de Nemours & Co.

Increasing the wet strength of fibrous materials by producing water-resistant size films on the fibers. No. 2,334,098. John Hubbard to Peter Cooper Corporations.

Treating textile materials, pad dyeing to produce a solid color effect which comprises subjecting textile materials having discrete fibers to an emulsion comprising fine droplets of organic solvent uniformly dispersed in an aqueous medium and drying to form a textile material having coloring matter bonded to its discrete fibers by a substantially continuous film of resinous substance. No. 2,334,199. Harley Jennings to Copeman Laboratories Co.

Artificial cellulosic filament delustered with titanium salt of a copolymer of acrylic acid and vinyl chloride. No. 2,334,358. Ralph Smith to American Enka Corporation.

Continuous spinning of cellulose solutions in strong mineral acids. No. 2,334,615. Heinrich Fink, Gustav Rath and Richard Hofstadt.

Water, Sewage and Sanitation

Treating the waste waters of the diffusion process in beet-sugar factories. No. 2,332,823. Teodor Wintzell and Nils Lauritz.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those interested in obtaining further information concerning the patents reported below should communicate with the Patent Department, CHEMICAL INDUSTRIES. Photostated copies of Canadian patents are available from the Commissioner of Patents, Ottawa, Canada.

Granted and Published February 23, 1943. (Continued)

Non-coniferous wood pulp sheet adapted for conversion into soda-cellulose and locally cut through its body at spaced intervals to promote influx of caustic soda solution thereinto and absorption of such solution thereby when it forms part of an assemblage of similar sheets in upstanding and contacting face-to-face relationship. No. 410,761. Reconstruction Finance Corporation. (George A. Richter and Chester H. Goldsmith.)

Method of producing cyclopentano-phenanthrene compound therapeutically valuable. No. 410,762. Schering Corporation. (Erwin Schwenk and Bradley Whitman.)

Exothermic catalyst reaction in which a feed of reactive substances is passed continuously through an elongated catalyst bed containing a stationary solid catalyst. No. 410,763. Shell Development Company. (Richard M. Deansly.)

Photoelectric consistency indicating and controlling apparatus. No. 410,764. Howard Smith Paper Mills Limited. (Douglas L. West.)

Method of making dies having accurate dioptric curves and optical finish. No. 410,773. The Univis Lens Company. (Charles V. Smith and Frank P. Williams.)

Process of galvanizing the interior and exterior surfaces of substantially closed containers. No. 410,775. John Wood Manufacturing Company, Inc. (Arthur Marland.)

Production of magnesia refractory for bricks and furnace linings. No. 410,778. Canadian Refractories Limited and The Honorary Advisory Council for Scientific and Industrial Research. (Norman P. Pitt and Lisle Hodnett.)

Method of filtering liquids such as oil and apparatus therefor. No. 410,784. Béla Sandor and Lewis Hajdu.

Granted and Published March 2, 1943.

Multicolor undersurface plate printing machine and method. No. 410,795. Myron A. Lathey.

Filter comprising a casing and a column of comminuted filtering material therein. No. 410,799. George E. Saussure.

Method of resistance welding for aluminum, magnesium and the like metals. No. 410,805. Aluminum Company of America. (George Strother Bernard, Jr.)

Reenforced needled fabric having little extensibility in the direction of its reenforcement. No. 410,807. American Reenforced Paper Company. (Patrick T. Jackson, Jr. and Elmer T. Anderson.)

Self-sustaining unwoven retiform sheet having one attenuated set of sparsely distributed generally parallel strands of unspun fiber superimposed over another set. No. 410,808. American Reenforced Paper Company. (Patrick T. Jackson, Jr. and Elmer T. Anderson.)

Flotation reagent comprising an admixture of primary and secondary unsubstituted alkyl amines having at least 10 carbon atoms in the alkyl radical. No. 410,809. Armour and Company. (Anderson W. Ralston and William O. Pool.)

Froth Flotation separation of a mixture of phosphate minerals and silicious minerals. No. 410,810. Armour and Company. (Anderson W. Ralston and William O. Pool.)

Apparatus for determining the change in density of a fluid flowing through a conduit between a reference point and a point remote from the reference point. No. 410,812. Bailey Meter Company. (John F. Luhrs.)

Synthetic fiber-forming linear polymeric amide colored with a dyestuff of the water insoluble cellulose acetate dye class. No. 410,825. Canadian Industries Limited. (Wallace H. Carothers and Isaac H. Godlove.)

Synthetic fibre-forming linear polymeric amide colored with a dyestuff of the azo class which contains not more than 3 azo groups and which when applied to the fibre was in water soluble form. No. 410,826. Canadian Industries Limited. (Wallace H. Carothers and Isaac H. Godlove.)

Synthetic fibre-forming linear polymeric amide colored with a water soluble dyestuff of the anthraquinone acid wool dyestuff class. No. 410,827. Canadian Industries Limited. (Wallace H. Carothers and Isaac H. Godlove.)

Laminated article comprising at least 2 laminae of porous, flexible sheet material bonded by an interlayer composed of one of the group consisting of polymerized caprolactam and interpolymers obtained by copolymerization of a diamine, a dibasic acid and caprolactam. No. 410,828. Canadian Industries Limited. (Wallace H. Carothers.)

Pest control adhesive composition consisting essentially of a 5 to 20 per cent solution of rosin residue in ethyl alcohol containing 0.25 to 2.5% of the Na salt of sulfated oleyl acetate. No. 410,829. Canadian Industries Limited. (Albert L. Flenner.)

Insecticidal compositions comprising at least one member of the class consisting of N:N'-di-(1-cyanoalkyl)-substituted **aliphatic and heterocyclic diamines and an inert carrier.** No. 410,830. Canadian Industries Limited. (Wilfred A. Sexton.)

Weed control composition containing as an essential active ingredient a sulfamate. No. 410,832. Canadian Industries Limited. (Martin E. Ceupery and Arthur P. Tanberg.)

Producing cellulosic material from vegetable matter in an acid solution and then in an alkaline solution a plurality of times in succession and washing the vegetable matter after each such boil. No. 410,843. Celec Corporation Limited. (Stuart M. Phillips and Arthur Baker.)

Frictional material comprising a mixture of approximately fifty to eighty parts of molybdenum sulfide by weight, ten to twenty parts of graphite and about twenty-five parts of a binder. No. 410,845. The Cleveland Graphite Bronze Company. (John E. Wilkey.)

Producing cyanine dyestuffs by condensing heterocyclic nitrogen bases containing a reactive alkyl-group with omega-alogen-fatty acids and further condensing the quaternary ammonium compounds thus obtained to cyanine dyestuffs in the presence of condensing agents. No. 410,855. General Aniline & Film Corporation. (Oskar Riester and Gustav Wilmanus.)

Contact insecticide comprising an organic compound containing not less than 11 and not more than 13 carbon atoms and consisting essentially of the nucleus $R_1-\underset{\underset{O}{\|}}{C}-R_2$, wherein R_1 represents an alkyl group and R_2 represents an alkyl, an aryl, or an aralkyl group. No. 410,856. General Chemical Company. (James W. Swaine.)

Use of isinglas in a fluffy, fibrous, flocculent condition in the manufacture of finings. No. 410,858. Gillman & Spencer Limited. (Alexander H. Gillman.)

Method of purifying 3-picoline contaminated by the copresence of at least one of the bases 4-picoline and 26-lutidine comprising heating the contaminated 3-picoline with sulfur and separating the unreacted 3-picoline from the reaction products. No. 410,880. Reilly Tar & Chemical Corporation. (Francis E. Cislak and William R. Wheeler.)

Purification of 3-picoline by catalytic partial-oxidation in vapor phase. No. 410,881. Reilly Tar & Chemical Corporation. (William R. Wheeler.)

Conversion of hydrocarbon oils into more valuable products. No. 410,891. Universal Oil Products Company. (Percy Mather).

Preparing trichloro-propionitrile by passing chlorine into one of the group consisting of acrylonitrile, beta-chloro-propionitrile, and alpha-beta-dichloro-propionitrile. No. 410,897. Wingfoot Corporation. (Joy G. Lichty.)

Preparing alpha-halo-acrylonitriles by combining a halogen with acrilonitrile to form alpha, beta, dihalo-propionitrile, treating the dihalo compound to remove hydrogen halide and recovering the alpha-halo-acrylonitrile. No. 410,898. Wingfoot Corporation. (Joy G. Lichty and James D. D'Ianni.)

Process for synthesising hydrocarbons which includes the step of passing a mixture of hydrogen and carbon monoxide through an alternating electric field whereof the frequency substantially synchronises with the natural molecular periodicities of the hydrogen and carbon monoxide. No. 410,907. Keith Williams, Phillip Pring and Thomas Andrew Lawrie. (Paul X. Spillane.)

Granted and Published March 9, 1943.

Process for the production of hydrocarbons which comprises passing a mixture of carbon monoxide and steam over a nickel catalyst, the gases first coming into contact with the catalyst at a temperature of 400-500° C. and then at a temperature of 150-250° C. No. 410,932. Henry Dreyfus.

Method of casting steel ingots which includes pouring the molten steel into the ingot mold and applying to the top a layer of ground cork to retard the cooling of the top of the cast metal. No. 410,941. Lewis B. Lindemuth.

Soda-lime type glass composition and batch. No. 410,942. Aaron Kerr Lyle.

Altering the coking characteristics of swelling and caking coals by pulverizing the coal and subjecting it to alternate vacuum and atmospheric treatments at an elevated temperature. No. 410,957. American Cyanamid Company. (Clayton S. Wolf.)

Treatment of coal by subjecting it in finely divided form to a controlled oxidation treatment in the presence of an oxidizing gas at elevated pressures and temperatures to alter the coking characteristics thereof. No. 410,958. American Cyanamid Company. (William J. Kruppa.)

Additional Canadian patents granted and published March 9, 1943, will be given next month.

Trademarks of the Month

A Checklist of Chemical and Chemical Specialties Trademarks

403,906 and 404,029. Radiator Specialty Co., Charlotte, N. C.; filed Aug. 17, 1942; Ser. No. 454,952-3, for compound for gasoline; tire-sealing cpd.; since June 15, 1942.

403,916. Park Stewart, Worthington, Pa.; filed July 6, 1943; Ser. No. 461,900; for flux; since June 1937.

404,023. Seaman Paper Co., Chicago, Ill.; filed May 25, 1943; Ser. No. 453,254; for vinyl coating; since Mar. 27, 1942.

404,035. Heatbath Corp., Indian Orchard, Mass.; filed Sept. 25, 1942; Ser. No. 455,756; for metal-treating baths; since Sept. 3, 1942.

404,215. Hill Mfg. Co., Atlanta, Ga.; filed Nov. 12, 1942; for deodorizing device; since Sept. 8, 1942; Ser. No. 456,774.

404,216. Leo J. Sauerbonr, as Lubaid Co., Milwaukee, Wis.; filed Nov. 24, 1942; for carbon solvent; since Aug. 10, 1942; Ser. No. 457,012.

404,231-2. Alken-Murray Corp., N. Y.; filed Sept. 3, 1943; Ser. No. 463,188-9; for inhibiting scale formation; since 1935, '38.

454,517. Polaroid Corp., Cambridge, Mass.; filed July 25, 1942; for transparent organic plastic composition material; since Nov. 1936.

454,998. Samuel L. Davis, as Transmotive Labs., Chicago, Ill.; filed Aug. 20, 1942; for rubber preservative; since Mar. 1942.

457,909-10. Chromium Mining & Smelting Corp., Ltd., Sault Ste. Marie, Can.; filed Jan. 14, 1943; for alloying; since May 15-June 15, 1941.

459,236. Century Lighting, Inc., N. Y.; filed Mar. 20, 1943; for fluorescent Fabrics; since Jan. 15, 1943.

459,950. L. Sonneborn Sons, Inc., N. Y.; filed Apr. 16, 1943; for paint; since Feb. 2 1943.

460,520. Earl Drew, Drew Labs., Chicago, Ill.; filed May 10, 1943; for detergent; since Sept. 10, 1942.

461,610. J. N. Huber, Inc., N. Y.; filed June 23, 1943 for resinous; since Dec. 1942.

460,768. Process Engineering Corp., Chicago, Ill.; filed May 20, 1943; for colloidal Graphite in liquids; since Nov. 5, 1942.

460,885. Stauffer Chemical Co., San Francisco, Calif.; filed May 24, 1943; for chemicals; since 1884.

460,914. The Varniton Co., Los Angeles, Calif.; filed May 25, 1943; for label varnish; since Jan. 1, 1936.

461,494. Pan-American Shell Corp., Jersey City, N. J., filed June 18, 1943; for flour and charcoal; since 1938.

461,523. National Lead Co., N. Y.; filed June 19, 1943; for iron oxide; since Sept. 1, 1932.

461,657. George A. Jeffreys, as Jeffreys, Salem, Va.; filed June 25, 1943; for enzymatic substances since Nov. 18, 1943.

461,658. George Jeffreys, as Jeffreys Labs., Salem, Va.; filed June 25, 1943; for feeds; since July 28, 1943.

461,799. Marathon Paper Mills Co., Rothschild, Wis.; filed July 2, 1943; for lignin products; since Apr. 10, 1943.

461,817. Industrial Diamond Co., Detroit, Mich.; filed June 2, 1943; abrasive for suspension; since Feb. 1943.

461,837. Arkansas Co., Inc., Newark, N. J.; filed July 3, 1943; for enzyme preparations; since January 1939.

461,994. Adhere, Inc., Los Angeles, Calif.; filed July 12, 1943; for plastic forming dies; since June 3, 1943.

462,002. The Dow Chemical Co., Midland, Mich.; filed July 12, 1943; for sizing, textiles, paper paints; since July 14, 1941.

462,083. Weldbestos, Inc., York, Pa.; filed July 14, 1943; for adhesive; since May 4, 1943.

462,129. Standard Oil Co. of Louisiana, East Baton Rouge, La.; filed July 16, 1943; for synthetic rubber; since Mar. 31, 1943.

462,161. General Printing Ink Corp., N. Y.; filed July 19, 1943; for ink.

462,240. United Gilsonite Labs.; Scranton, Pa.; filed July 22, 1943; for roof paints; since June 1, 1943.

462,420. Monsanto Chemical Co., St. Louis, Mo.; filed Aug. 31, 1943; for paper cartons; since Aug 25, July 11, 1943.

462,458. Monsanto Chemical Co., St. Louis, Mo.; filed Aug. 2, 1943; for sizing; since June 11, 1943.

462,460. Philadelphia Quartz Co., Phila., Pa.; filed Aug. 2, 1943; for adhesives; since Apr. 13, 1936.

462,636. Ferro Enamel Corp., Cleveland, O.; filed Aug. 10, 1943; for porcelain enamel frit; since June 15, 1943.

462,715. Minnesota Mining & Mfg. Co., St. Paul, Minn.; filed Aug. 13, 1943; for electrical tape; since May 1933.

462,773. Malrex Chemical Co., Malden, Mass.; filed Aug. 16, 1943; for plasticizer; since July 19, 1943.

462,834-5. Acme Chemical Co., Milwaukee, Wis.; filed Aug. 19, 1943; for floor; since July 1, 1930.

462,835. Acme Chemical Co., Milwaukee, Wis.; filed Aug. 19, 1943; for liquid wax; since May 1, 1942.

462,873. Manuel Ontanon Delgado, Anahuac Colony, Mexico City, Mexico; filed Aug. 20, 1943; for paints; since June 2 1942.

462,910. The Dow Chemical Co., Midland, Mich.; filed Aug. 21, 1943; for resinous ion exchange agent; since June 8, 1943.

462,923. The Maizo Mills Co., Circleville, O.; filed Aug. 21, 1943; for fur cleaning and metals; since Apr. 5, 1924.

462,927. Oronite Chemical Co., Wilmington, Del.; filed Aug. 21, 1943; for rubber extenders; since May 17, 1943.

462,961. Allied Chemical & Dye Corp., N. Y.; filed Aug. 24, 1943; for dyes; since May 28, 1940.

463,002. Rheem Mfg. Co.; Washington, D. C.; filed Aug. 25, 1943; for base metal corrosion resistant; since Mar. 12, 1943.

463,058. August Tobler, as Tobler Chemical Co., Portland, Conn.; filed Aug. 27, 1943; for oxidizing; since July 1, 1943.

463,060. Ault & Wiborg Corp., N. Y.; filed Aug. 28, 1943; for compounding with synthetic rubber; since Mar. 10, 1943.

463,073. Hoover Brothers, Inc., Kansas City, Mo.; filed Aug. 28, 1943; for adhesive; since Apr. 15, 1943.

463,088. American Chemical Paint Co., Ambler, Pa.; filed Aug. 30, 1943; for treating metal surfaces; since July 28, 1943.

463,205. Irvington Varnish & Insulator Co., Irvington, N. J.; filed Sept. 3, 1943; for electrical insulation; since July 30, 1943.

463,439. Fal Products Co., Phila., Pa.; filed Sept. 16, 1943; for cleaning; polishing metal; since Oct. 1918.

463,449. United Chemical Co., Inc., Kansas City, Mo.; filed Sept. 16, 1943; for metal polish; since October 1918.

Trademarks from Official Gazette of U. S. Patent Office, October 19, to Nov. 9, 1943.

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403,916

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404,023

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404,029

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ALKEN CERTIFIED SCAL OFF
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PROLATEX
454,998

MAN-X
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459,236

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462,773

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462,873

IONEX
462,910

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462,923

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SOLVENTOL
462,961

IRIDITE
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BLAXITE
463,058

MALTAK
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463,073

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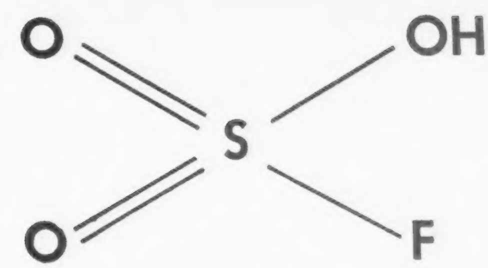

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Copper Ammonium Fluoride
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Ferrous Fluoride
Fluoride Fluxes
Lead Fluoride
Lithium Fluoride
Magnesium Fluoride
Nickel Fluoride
Polyacid Fluorides
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Potassium Fluoride, Crystal
Sodium Bifluoride
Sodium Fluoride
Strontium Fluoride

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Ammonium Fluoborate
Cadmium Fluoborate
Chromium Fluoborate
Ferrous Fluoborate
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